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Canadian News Print Situation Complicated

Hearst Interests Rumored to Have Renewed Contract With Anglo-Canadian Pulp & Paper Mills to Supply Requirements at Favorable Price—Newly Formed Consolidated Paper Corp. Would be Seriously Affected—Interesting Legal Tangle Forecasted —Proposed Newfoundland Development Indefinitely Deferred

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., January 4, 1932—Another disturbing complication has arisen in the news print industry here, if rumors appearing in the papers here are correct. The rumors are to the effect that the Hearst interests have renewed their contract with the Anglo-Canadian Pulp and Paper Mills at a favorable price. If these rumors are correct, then not only has an interesting legal tangle been opened up, but the position of the newly formed Consolidated Paper Corporation will be seriously affected.

Among the companies brought into the original merger under the name of the Canada Power and Paper Corporation (which Consolidated Paper supersedes) was the Anglo-Canadian Pulp and Paper Mills, which had a contract with the Hearst interests expiring in 1933. At the time of the reorganization of Canada Power and Paper, Anglo-Canadian dropped out of the combine and reverted to its independent status. Prior to this the Hearst interests made a contract with the Dominion Newsprint Company, a Hearst company, to supply all the Hearst requirements after the expiration of existing contracts. Among the plans of the company was the erection of a news print mill of 1000 tons per day capacity in Newfoundland. Canada Power and Paper Corporation subsequently took an interest in the Dominion News Company. Developments in Newfoundland were indefinitely deferred, due to various circumstances, among which were differences with the Newfoundland governments, and the Hearst contract was taken over by Canada Power and Paper, which in its turn has been taken over by Consolidated Paper, in whose plans for the future the Hearst contract has been a most important consideration, seeing that Hearst buys annually about half a million tons of news print.

If, as is now rumored, the Hearst contract with Anglo-Canadian has been renewed, what is the legal position of Consolidated Paper in the matter? Newspapers here are speculating on the subject, but needless to say they have no answer to the question

Consolidated Paper Wins Out

The last barrier to the ratification of the reorganization plan of Canada Power and Paper Corporation has been removed during the week by a Superior Court decision in Montreal upholding the plan of the Securities Protective Committee and rejecting the contention of a Belgo Canadian preferred shareholder that the scheme should be altered to give Belgo preferred shareholders a greater equity in the assets of the new company, Consolidated Paper Corporation.

In his judgment, Justice Boyer pointed out that the scheme submitted to Belgo shareholders was ratified by an overwhelming majority. It was true, His Lordship noted, that the bonds and stocks of the Belgo company had a higher value than those of other companies taken into the new corporation, but that fact had been taken into consideration by the committee in forming its plan. It had been urged that the balance sheets of the various companies had not been taken into account in determining the value of their shares in the reorganization, but the evidence showed that even if this procedure had been followed the result would have l een the same.

In view of the good faith of the contestant, His Lordship dismissed the contestation, each party to pay its own costs.

Eddy Company "Carries On"

The E. B. Eddy Company, Ltd., of Hull, Que, which is regarded as one of the soundest concerns in the pulp and paper trade in Canada, has shown its faith in the future by installing a $500,000 filtration plant during the past year. The plant was officially opened a few days ago, and the Mayor of Hull and the President of the Hull Board of Trade extended their felicitations and best wishes to the company. Not satisfied with what it has done, the company announced that if conditions improved it would proceed with extensions, spending as much money in 1932 as in 1931. The whole program of reconstruction, it was stated some time ago, might run over a period of years to as high as $12,0000,000. The complete plan of rehabilitation involves the concentration of the company's activities around the lower mill site, and embraces the installation of new paper machines, and the rebuilding of the sulphite pulp mill, bleaching plant and ground wood pulp mill.

Other improvements laid down in the scheme include the concentration and enlargement of boiler capacity, the rearrangement of storage and handling facilities, additional pulp preparation equipment and the erection of a new office building.

Activities of Fox River Valley Paper Mills

Hummel & Downing Co. Inaugurates Four-Shift Plan to Furnish Employment to More Workers—Northern Paper Mills Take Care of Laid-Off Employees by Paying Dismissal Wages—Wisconsin Newspapers to Divulge Source of News Print Used

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., January 4, 1932—Adoption of a four-shift plan has enabled the Hummel & Downing Company, Milwaukee, to furnish employment to approximately two hundred more persons who otherwise would be idle. The plan has been announced a complete success by John L. Barchard, president, and he says the company is experiencing the greatest year in its history as a result of the new schedules. The plan is similar to that inaugurated by the Kellogg Company, food manufacturers of Battle Creek, Mich.

Mr. Barchard has put the paper mill, power and paper stock departments of his plants on the six-hour, four-shift basis. This schedule replaces the three eight-hour shifts. The employees work five days a week and alternate the day and night shifts so none is favored as to day work over night work.

In the converting departments, the company has inaugurated two five-hour shifts. Occasionally the afternoon shift gets overtime work, but by alternating the two shifts, none is favored with the extra time. These departments work five and a half days a week. Approximately 700 are on the payroll and the employees have co-operated heartily to divide the work while the situation is acute.

Mr. Barchard, as president of the Wisconsin State Chamber of Commerce, has been one of the strongest opponents of legislative interference with employment problems of manufacturing concerns, and advocated in hearings before the state legislature plans similar to this to alleviate unemployment.

Lake Winnebago Level Restored

Paper manufacturers in the Fox River valley have won out with the municipalities in their fight to have Lake Winnebago maintained at a high storage level as protection against drought and summer seasons of low water stage. The result of recent hearings has been an order issued by the U. S. Engineering Department to establish a maximum level of 21¼ inches of water above the crest of the control dam at Menasha, Wis., where the water is released to power dams of the Fox River.

Riparians opposing the high level succeeded at one time in having the level lowered to 15 inches but the resulting conditions made the high level advocates successful in their fight. When the low level was in effect, water power was abandoned entirely by some mills during the summer drought, and sanitary conditions were almost intolerable. Navigation was also seriously affected. The owners of riparian lands are understood to be planning new moves to change the regulation, but it is believed the order will remain in effect.

Northern Alleviates Unemployment

"Dismissal wages" have become a policy in temporary effect at the Northern Paper Mills, Green Bay Wis., as a means of alleviating hardship to men who must be laid off. With little construction work to offer and moderated operations because of heavy warehouse stocks, the company has found it a problem to guarantee jobs to all men employed there for some time. Twelve have been laid off and are paid enough weekly to keep their families in comfort. The plan represents an unemployment idea inaugurated by Judson G. Rosebush, vice president and general manager. Dismissal wages are paid only until the men can find other employment or work at the Northern mills.

Through voluntary plans of mill workers, 75 additional men are assured jobs until spring. The men worked out a six-hour shift system in some departments, adding one extra shift daily. The extra shift was offered to men who were about to be laid off from other jobs and thus a large number of prospective unemployed have been absorbed. The change meant less wages for those formerly on eight-hour shifts but they were willing to co-operate to divide work.

Kimberly-Clark Wins Tax Protest

Kimberly-Clark Corporation, Neenah, Wis., will not have to pay the federal government $652,389.49 of income and profits taxes assessed against it, under a decision announced by the bureau of internal revenue. The abatement represents tax deficiencies for the year 1917 through 1920, which were protested by the company. The bureau ruled that the liabilities for those years have been paid by the transferee of the property of the company and the abated sum thereof represents an over-assessment.

Attempts to Ban Foreign News Print

An attempt to drive Canadian competition in news print out of Wisconsin by the pressure of legal enactment is taking place in the special session of the state legislature. The assembly has passed by a vote of 73 to 2 a joint resolution requesting all newspapers and magazines published in Wisconsin to state at the head of their editorial columns the source of their news print. It is contended that many newspapers and magazines are purchasing paper in Canada, thereby causing unemployment in Wisconsin mills. When the resolution comes before the senate, it may fare differently, because the assembly is almost wholly Progressive Republican in partisan makeup and is passing everything Governor LaFollette recommends. The senate is largely in control of Conservative Republicans, who are acting as a safety valve to the extreme legislative program.

Reforestration Program

Through efforts of R. B. Goodman, Marinette, Wis., a capitalist interested in Wisconsin paper mills and a member of the Wisconsin Conservation commission, tree planting will be speeded up on state owned lands in Northern Wisconsin, with preference given to tracts near pulp and paper mills. It is the commission's policy, he announced, to cooperate with the mills to plant pulp wood species, in order to alleviate the growing seriousness of the supply of raw materials. Present planting is done at the rate of 1,000 acres annually, but the program is to be speeded so 8,000 to 10,000 acres will be planted yearly. About 5,000,000 seedlings will be purchased and options obtained on lands in Douglas, Juneau, Wood and Marinette counties. Prison labor will be used, by means of camps for trusties established at these various tracts.

The Nekoosa-Edwards Paper Company, owners of large reforestation areas already planted, is arranging to increase its acreage. Application has been made to place another large tract under the provisions of the forest crop law.

which exempts the timber from taxation until cut, except for an annual fee of ten cents an acre.

News of the Industry

Work will be started shortly after January 1 on the new $50,000 shipping dock at the Hoberg Paper and Fibre Company, Green Bay, Wis. Local contractors will be favored, and hand labor will be used as much as possible. The dock will be 400 feet long, and will enable large freighters to bring raw materials right to the mill, instead of being hauled from other city docks. The company expects to ship coal, pulp, sulphur and other materials via water.

Front page publicity in the *Chicago Tribune* has been given the Badger Paper Mills, Inc., Peshtigo, Wis., because this city is one of the few in the United States that knows no depression. Every man is employed and additional men are being obtained from the nearby city of Marinette.

This happy situation comes about because of the work of E. A. Meyer, president and general manager. He took over the bankrupt Peshtigo Paper Company and by developing a line of specialties for a ready market has made the company profitable in less than three years and has retired part of its bonded debt. The sulphite mill is producing 60 tons daily, and the paper mill 50 tons. The converting department is producing printed wax bread wrappers, wax paper specialties, and sulphite bond, plain, watermarked, mimeograph, ledger and drawing paper, using the company's own bleached sulphite. About 250 men have steady work.

A loss of $10,000 was experienced by the Marinette & Menominee Paper Company last week when fire consumed a large quantity of hemlock slabs in the Marinette yard. It is believed that boys smoking in the vicinity were responsible for setting the fire. Lack of wind enabled fire departments of two cities to keep the fire from spreading to other parts of the yard.

Another month has been added to the sensational record of the Interlake Division of the Consolidated Water Power and Paper Company at Appleton, Wis., where there has not been a lost time accident since February 16, 1930. The Stevens Point mill also has sixteen months to its credit. The combined record of the five mills is fourteen lost time injuries in eleven months, the best record ever made by the company in all of its mills.

Employees of the Marathon Paper Mills Company mill at Ashland, Wis., surprised their manager, B. H. Metternich, by staging a party in his honor. The attendance was 150. He responded with a short talk in which he expressed his appreciation of the co-operation given by employees in improving operation of the mill during the last year.

Employees of the Nekoosa-Edwards Paper Company, Nekoosa and Port Edwards, Wis., were treated to a Christmas party which included attendance at a motion picture theater. The theater was filled to capacity.

Cranes Start Stationery Plant

[FROM OUR REGULAR CORRESPONDENT]

DALTON, Mass., January 6, 1932—The new stationery plant of Z. & W. M. Crane is to be put in operation this week under a new policy by which the manufacturing and selling of the Crane stationery lines, formerly handled by the Eaton, Crane & Pike Company of Pittsfield will be conducted at the Dalton Mill. A four story building formerly used as a shoe factory has been renovated for this purpose containing 32,000 square feet of floor space. This mill will do business as a unit of the Eaton Paper Company. Gordon Blanchard formerly with the Crocker-McElwain Company of Holyoke is now connected with the sales department of this Company.

E. A. Skidmore Resigns

[FROM OUR REGULAR CORRESPONDENT]

TROY, Ohio, January 4, 1932—Miami Valley paper trade circles this week were informed of the resignation of E. A. Skidmore, for the past nine years associated with the Gummed Products Company, and who relinquished his duties the first of the year as general manager of that concern.

Mr. Skidmore entered the service of the Troy company as cost accountant and rose to an executive position, serving for a time as mill superintendent, thus familiarizing himself with every branch of the gummed paper and cloth business, largerly under the tutelage of Fred. Holt, one of the founders and builders of the Troy company and who is widely known in the paper trade. Mr. Holt has been in California for a protracted period, for the benefit of his health.

Following his graduation from Hillsdale, Michigan, College, Mr. Skidmore was engaged in educational work and settled in Troy to become a member of the high school faculty. His record in that line was successful but he considered the industrial field a more important one and became connected with the gummed paper branch of the paper trade. He refused to give up this work subsequently when offered the principalship of the Troy High School.

While his plans for the future are said to be indefinite, Troy friends are hopeful he will remain as his family has made a place in the religious and social life of the community and Skidmore has always been a civic leader.

Colorado Paper Mill Sold

[FROM OUR REGULAR CORRESPONDENT]

DENVER, Col., January 4, 1932—All property and assets of the Colorado Pulp and Paper Company, the mill located just outside of the city limits of Denver, was sold at public auction on the court house steps at Brighton, Adams county, Colorado, December 29, for $150,000.

There was only one bidder and that was the Colorado Paper Products Company, present occupants and operators of the mill, which is headed by Max Bronstine. The only cash passing was an amount sufficient to pay court costs.

It will be recalled that when this property was first offered for sale, about five years ago the court set a price of not less than $300,000.

The building is of steel and concrete, bright, airy, located where water is plentiful and has connections with various railroads via spur tracks.

Unless there are more legal entanglements to bob up, this sale should give the property a clearance and it should have clear sailing as there is not another paper mill in this section, in fact not within hundreds of miles.

New Corrugated Liner Micrometer

E. J. Cady & Co., of 549 West Washington street, Chicago, recently introduced a new Corrugated Liner Micrometer and the number of concerns selling corrugated boxes who now use it report it is giving great satisfaction.

By the use of this micrometer the samples showing the caliper tests are preserved for record. The instrument is so constructed that the lower anvil arm passes between the tips of the corrugations and calipers the liner without silicate interference. It is built on the same operative principle as the regular standard Cady micrometer reading .200 around the 6-inch dial and in most other respects is similar in construction to the regular Cady desk model.

Pennsylvania Paper Mills Operating Lightly

Majority of Manufacturers Are Working On Part Time Schedule, With Production Confined to From Three to Four Days Weekly—Some Local Plants Were Closed Down During Holiday Period—Demand for Book Papers Fairly Persistent

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, January 4, 1932.—Quieter trading and the announcement of almost general price reductions in higher grade bonds and ledgers were factors in the closing days of the 1931 business cycle. While the announcements of price reductions on the better grades of bonds and ledgers were anticipated over the year end trading it was not expected that these recessions were to be so scattered over the large number of manufacturers who were involved.

The cheaper grades have been subjected to lower quotations throughout the year, but the higher qualities of these rag content papers held well throughout the dull days of the depression so that price changes of so broad a scope were surprising. The cuts involved from 5 to 8 per cent in various mills. In announcing the price changes the mills explained that present values were cut to pass on to the public the lower prices paid for raw materials, which enabled the manufacturers to produce at lessened costs in production.

Distributors are not yet ready to take advantage of the lower prices, as many are already stocked with the better grades of writing papers involved in the cut, and will have to dispose of these stocks before they are able to take advantage of the new lists for 1932. Cheaper grades of bonds and ledgers are well sold up, as the drastic recessions of the year promoted sales, while the better grades held and moved in small lots as consumers required.

Wholesalers of book papers report a fair volume of demand for the bulkier grades and with present orders covering from six to eight week contracts at the low prices of the past year—the lowest in post war period. Wrapping papers are draggy, as the distributors quiet down from the activity of the Christmas season. Glassines are among the grades of paper that hold fairly active, as their use in combination with cellophane promotes sales, although much competition prevails and unsteadies prices.

Local paper manufacturers are on part time schedule, with production confined from three to four days of the week. A few mills were shut down over the holidays. Paper stocks are draggy and show the same tendency in prices as in the past quarter of the year, with quotations made at the option of the mills.

Dill & Collins Co. in Equity Receivership

Following the policy of the officials and directors of the Dill & Collins Company, one of the oldest paper manufacturing concerns in the country and reputed to be of direct lineage to the first paper mill in America, an application for friendly receivership was made to the U. S. District Court here last Tuesday. The applicant for the receivership in equity was Harold Collins, son of President Grellet Collins, of the Dill & Collins Company, who, with Samuel W. Hammer, was appointed co-receiver of the company by the Federal Court. In stating the cause for the request of the friendly receivership, the younger Collins stated that the company was unable to manufacture profitably under present business conditions, and the action was taken to protect its assets until betterment enabled continued favorable operations.

The Dill & Collins Company, engaged in production of printing and book papers, has a business history extending back to 1690, when it was founded as the original papermaking concern of David Rittenhouse, who was the first to manufacture paper in America, and whose mill was located on the Wissahickon, in Fairmount Park. For many years the Dill & Collins Company was engaged in the manufacture of paper at Richmond and Tioga streets in its own mill, and about 25 years ago took over the old Flat Rock mills, owned by William H. Nixon, and here made its famous Flat Rock papers and Diamond D marks. About four years ago the Flat Rock mill was closed and later leased to the Scott Paper Company, while the new machines were bein built in the Chester, Pa., mills of that company. In recent times they have been idle, the Dill & Collins Company confining its manufacture to the Richmond mills, where business will be continued as formerly.

Considine Resigns from Paper Trade Association

Norbert A. Considine, president of the Paper House of Pennsylvania, announced this week that his firm had withdrawn from membership in the Paper Trade Association of Philadelphia, effective at the end of the fiscal year. Mr. Considine has been vice president of the association for the past two years and Philadelphia's representative on the Board of the National Paper Trade Association. Prior to that he held the office of secretary for many years. His firm has been a member of the local group for over a dozen years.

Mr. Considine has been one of the most active workers in association enterprises. While he has declined to discuss in detail the motives for his resignation, it is believed in the trade generally that the matter has been under consideration in the Paper House organization for some time and only Mr. Considine's loyalty to President William S. Wilcox has led him to withhold his action until the end of Mr. Wilcox's term of office. The executives of the Paper House of Pennsylvania have been persuading Mr. Considine for some time that more of his time and energy belonged to his own business and that at present it is futile to attempt any constructive program in the local organization.

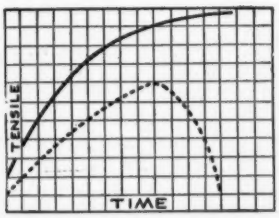
In addition to his paper trade activities, Mr. Considine is First Vice President of the Poor Richard Club, and actively in charge of the Club's Advertising Institute, which is staging a series of Round Table discussions on advertising topics that have attracted great interest in the advertising world. He is also a director of the Philadelphia Chapter of the American Market Society, composed of market research men from large industries, advertising agencies and merchandising establishments. This week he was one of the speakers at the Conference in Washington, D. C., on "Utilization of Census Distribution Data" held at the U. S. Bureau of Foreign and Domestic Commerce, under auspices of the American Marketing Society.

Garrett-Buchanan Co. Celebrates

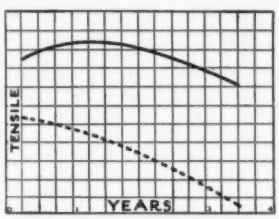
With an entire afternoon given over to celebration of the Yuletide program, the staff of the Garrett-Buchanan Company suspended business on Christmas Eve and rallied beneath the lighted tree erected on the main floor of its building. There the group of employees joined in carols, heard recitations of Yuletide cheer, and were addressed by

(Continued on page 56)

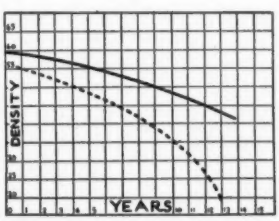
TENSILASTICS can't help saving your money; It's the way they're built . . .



TENSILE STRENGTH: Dotted line indicates previous standard for curing ordinary rubber. Note peak at critical point and sharp drop of over-cure. TENSILASTIC —(solid line)—has no peak—no over-cure hazard. Tensile notably higher... BETTER WEARING QUALITY.



AGING: Ordinary rubber (dotted line) loses tensile quickly, deteriorating with time. TENSILASTIC (solid line) actually increases in tensile for a long period,—then drops far more slowly than ordinary rubber,—LONGER LIFE.



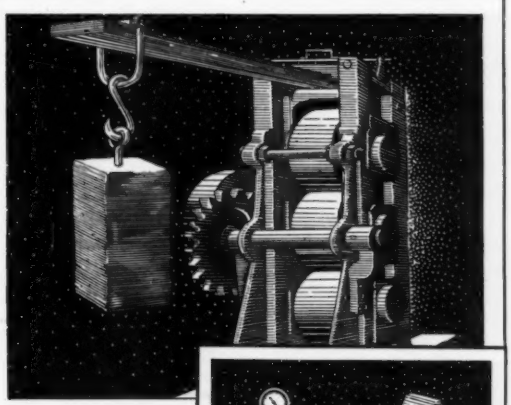
DENSITY: Ordinary rubber (dotted line) hardens as time passes. TENSILASTIC (solid line) maintains original density with very slight tendency to harden as years pass,—MORE DEPENDABLE SERVICE.

We've been broadcasting the story of Tensilastics' "Banker Proof Savings" for several months, with a chorus of actual mill records in support. Now we pause for station announcements—and to take you behind the scenes and show you how Tensilastics get that way.

Tensilastic is more than a trade name. It is a distinct type of rubber compound,—totally unlike any other rubber compound available.

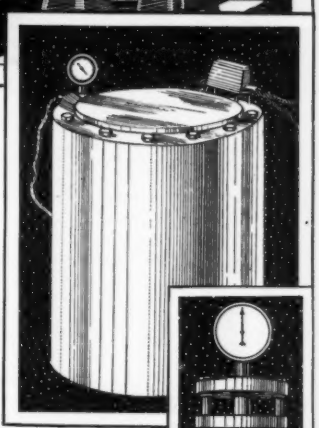
It outlives ordinary rubber tremendously,—both in service and in storage. It shows amazingly longer life between grindings; is superresistant to oxidation, deterioration, distortion, corrugation, wear and abuse. Its tensile strength, after three years of use, is actually higher than the original tensile of ordinary roll rubber. Every specification of density, plasticity, compound and cure can be controlled within the closest limits ever attained, and can be duplicated, again and again, at any time.

Try Tensilastic Rubber Rolls on your machines,—as table rolls, press rolls, felt, breast and couch rolls, wire carrier and stretch rolls. You'll gain a new appreciation of the possibilities of rubber, of improved production, of added life for wires and felts,—and of low cost measured in service and performance.

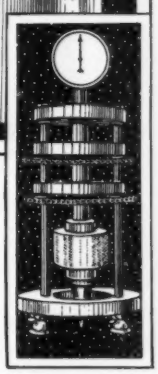


This device wears rubber rolls at 25 times the speed and pressure of normal service.

Special devices such as these enable us to determine the effects of years of service. WE, —NOT YOU, —DO THE EXPERIMENTING.



Electric aging bomb duplicates in a day a year of atmospheric aging.



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T17

Uncertain Outlook for Canadian News Print

While Some Operators Anticipate Upward Trend In Demand This Year, Others Do Not Look for Material Advance Until 1933—Any Increase In Earnings Must Come From Decreased Operating Expenses, or Premiums Received On New York Funds

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., January 4, 1932—Canada's news print industry has closed one of the worst years in its short but turbulent history. It faces another twelve months of uncertainty, but it is a period which holds some promise of the settlement of one or more of the many problems confronting the manufacturers. In so far as production is concerned the current year does not hold out much hope for any marked increase. Some news print operators do not look for a material advance in demand for paper until 1933. Others believe that the upward trend in demand will take place this year. Judging by the trend in advertising and in the desire of the publishers to cut expenses, it is unlikely that there will be any increase of a major size in news print consumption this year. Last year Canadian production approximated 2,250,000 tons, a drop of about 250,000 tons from 1930. Unless there is a marked change in business conditions and consequent resumption of advertising on a wide scale, production by the Canadian mills will not show any material improvement in 1932 over the 1931 figure, it is thought.

There is little prospect of a price increase this year, or the next for that matter. Forces appear to be at work even now to effect another cut in news print, but it is likely that this attempt will be met with more united front by the producers. The earning power of the operators will depend largely on the discount of the Canadian dollar.

With no increase in price likely and production at or around the current level, any increase in earnings must either come from the drop in operating expenses or through the premiums received on New York funds. Operating costs have about reached the bottom and little saving is to be expected in that quarter, so that an improvement in earnings will most likely depend almost solely upon the trend of exchange. An improvement in financial position will hinge upon the outcome of the present negotiations looking toward a merger.

Kraft Paper for Bates Valve Bags

The Canadian Bates industry—Bates Valve Bag Company, Ltd., using Canadian-made kraft paper from Dryden, Ont., and Three Rivers, Que., has successfully developed a flour sack during the past year. In the hands of Bates engineers the paper bag has become a giant of size and strength, three to five plies of sturdy kraft paper combining to carry 100 pounds or more of heavy materials, and to survive manhandling and weather. Over 60 per cent of the cement shipped in the Dominion moves in paper bags of this character. And now comes the flour sack. Early in the past summer the Bates officials felt confident enough of the latest model to build the actual machine and a practical start was made at the Copeland Flour Mills, at Midland, Ont. Ever since the installation at this point the machine has been in daily action, filling three pre-closed 98-lb. bags per minute, without human hand coming into contact with the floor, and with an accuracy which the authorities have declared well within the legal tolerance. It may be surprising to those in the paper industry to learn that Canada consumes something like half of the total production of wheat flour, and that of the domestic supply about half goes to the baker. The bag unit used by the bakery trades is one holding 998 lbs., or a half ton of flour. The new bag consists of four walls of kraft paper, the outside ply of 50 lb. basis, and the other three of 40 lb. each. The bag is of the gussetted, sewed-end variety well known in the cement field. The manufacture of a thousand such bags consumes more than 759 lbs. of kraft paper. The flour company reports that they have shipped almost 100,000 such bags to baking houses in Ontario, the Maritime Provinces and Quebec. It is claimed that the filling of the new bags is more rapid and involves less waste of flour through spillage. The new paper bag is also found to stock more solidly than fabric and to occupy appreciably less space in storage. Additional flour mills, it is said, will sign up with the Bates Valve people during the coming spring and summer.

Notes and Jottings of the Trade

Provincial Paper Ltd., in a broadside issued with a Christmas blotter, states that, like many other firms and individuals, they believe that business is going to be better in 1932, although competition will remain keen both in paper and printing circles. The blotter is put out as a message for Oxford Super, one of Provincial's leading lines.

The Ontario paper trade regretted to learn of the death in Montreal of J. A. Cameron, a prominent notary of that city, and a director of the Howard Smith Paper Mills. Deceased was prominent in church and Masonic circles.

The fine new warehouse and offices of the Buntin Reid Company, Ltd., who for many years have occupied premises on Scott street in the down town district of Toronto, have been completed and the beginning of the year saw the firm located in their new quarters at Richmond and Peter streets. There are many printing plants in the district and paper offices, such as Provincial, Abitibi, Don Valley and Interlake Tissue are within a few blocks of the new warehouse.

The Hon. W. H. Price, Attorney General of Ontario, in the course of an interview, stated that the Government revenue from various sources would be substantially cut in 1932. Among such sources he mentioned that of timber and pulpwood dues. "Our timber activities in Northern Ontario," he said, "on account of few lumbermen being in the woods, will not pay nearly as much in dues. It will mean, probably, a reduction of $1,500,000."

Word has reached the Ontario paper trade of the death at Barnsley, England, of W. S. Aitken, a widely known British paper maker, and known to many in this province. After being engaged with the Barnsley Paper Mills, the late Mr. Aitken took up an appointment with the Punjab Paper Mills in India, but of late years he had been living in England.

The many friends of George Brain, of the Toronto office of the Rolland Paper Mills, were pleased to see him about again after his recovery from an operation in Toronto General Hospital.

A recent visitor in Toronto was Sir Keith Price, chairman of Price & Pierce, and of the directorate of Price Bros., Ltd., and who makes his headquarters in London, England. Sir Keith visited various parts of Canada in the interests of Price Bros., Ltd., and spent some time at the firm's pulp, paper and power plants in Quebec.

ECONOMIES OBSCURED BY DOLLARS

HOW much does it cost you to run without equipment you think you cannot afford to buy? In many cases the cost is sufficient to equal the purchase price of the equipment in a few months' time. You have machines, men to run them and power to drive them, but economical production of paper or board is achieved only when all operating wastes are eliminated. If the installation of Downingtown Suction Rolls on your fourdriniers or Downingtown Extractor Rolls on your cylinder machines, would improve production or operation, can you afford to permit their moderate initial cost to delay the installation? Every day of operation without them would mean that part of their purchase price would be wasted, just as though you daily destroyed part of your output. Delay may be costing you money, therefore why not investigate these rolls immediately. On request we will gladly call on you or mail descriptive literature and actual performance facts showing the savings obtained by mills making various grades of stock. The Downingtown Manufacturing Company, Downingtown, Penna.

DOWNINGTOWN

Chicago Paper Market Conditions Unchanged

During Holiday Period Actual Sales Activity Was Practically At Standstill, With Exception of Some Small Orders for Immediate Delivery—With Consumers Stocks Diminished, Paper Distributors Anticipate Good Demand In Near Future

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., January 4, 1932.—Actual sales activity in the Chicago paper market is more or less at a standstill this week. No further news of great importance has been reported since the rag content papers finally fell in price from their more or less lonely position apart from the general market. Small orders, with rush delivery requested, were fairly numerous among jobbers and manufacturers representatives and there was little or no "marking time" as preparations were being made for the New Year.

Sales organizations here have philosophically accepted the state of business and are going out to sell paper in 1932 irrespective of past performances. Following inventory and with promises in evidence that prices are being more or less stabilized, paper men expect a fairly heavy demand for business from the majority of the consumers, who have sadly diminished their stocks in the "watchful waiting" process.

Kraft papers, with bags and wrapping experiencing a better holiday demand than expected, continue steady as far as price is concerned and a tendency for more orders to come in, and on a more frequent basis, is credited to this semblance of price stabilization, say reports. News print prices and the news market in general, will be at a lower contract figure for 1932, but this was expected and the market can be characterized as "normal." Fine papers are fairly steady and orders are small but insistent. The board market is slow. Waste papers are seasonally at a standstill.

Association Activities

The Chicago Paper Association will hold its next regular meeting on Tuesday evening, January 12, at the Bismarck Hotel, Chicago, according to information received from M. A. McNulty, chairman of the public relations committee of the association. At that meeting and at the later meeting in January the trade relations committee and the entire membership will probably begin making arrangements for attendance and cooperation at the February meeting of the National Paper Trade Association in New York City.

Salesmen comprising the membership of the Middle West Division of the Salesmen's Association of the Paper Industry will get together again on Monday noon, January 4, to resume their regular weekly meetings after an intermission lasting throughout the holiday weeks. No special speaker has been arranged for the program but the nominating committees will be getting busy preparing a ticket for the annual elections, scheduled to take place in February.

Increased Advertising Volume Predicted

Chicago paper dealers and representatives specializing in papers used in direct mail and publication printing were fairly well pleased with the report from the Association of National Advertisers relative to the general sentiment in regard to advertising appropriations for 1932. Since advertising lineage is the backbone of the newspaper and magazine and since appropriations are the necessary function for any direct mail campaign the figures were scanned with interest. About 175 companies, says the association, have already made definite advertising plans for 1932. Of this group, 53 have reported that they will spend more for advertising in 1932 than in 1931; 57 will repeat the 1931 appropriation, and 64 expect to spend less. Accordingly, of this group of 174 concerns, 110 will spend either as much or more than in 1931, while only 64 of the total expect to spend less. Of the 174 companies, 101 stated that slowness on the part of advertising mediums in adjusting rates to fit present conditions was the principal cause for having their 1932 appropriations dammed up. Paper representatives were not so much interested in the rate question as in the possibilities of better and more advertising in 1932 than in 1931. Direct mail campaigns will play an important part in most of the advertising setups already arranged. This is taken as favorable to the paper industry by those, who see the use of both envelopes and printed pieces increased. News print representatives are also taking heart and expecting to see newspaper advertising, tried and true over a period of many years, immediately reflect an improvement in business to the betterment of the demand for news print.

News of the Trade

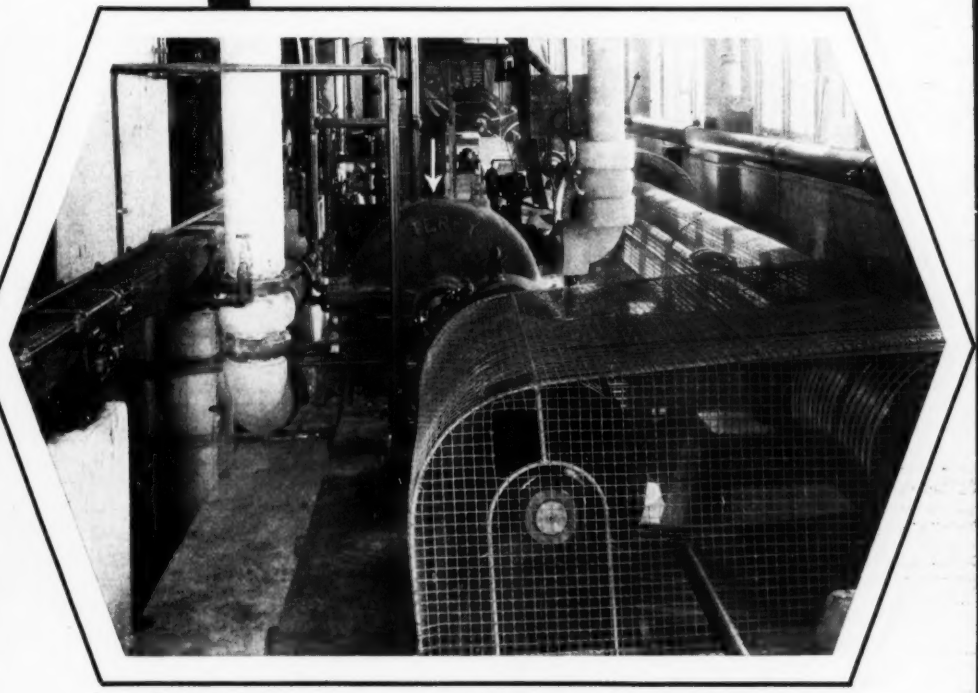
W. S. French, president of Brooke, Smith & French, Inc., Detroit advertising agency, has been elected a director of the French Paper Company, of Niles, Mich. This change follows the election of Frank G. French as president to succeed J. Edward French, who died recently. W. S. French is well known in Chicago and to many members of the paper trade.

An event of importance to the Chicago paper trade, although in an allied field, will be held at the Hotel LaSalle, Chicago, on January 20, 21 and 22 when the Chicago Advertising Council will hold its second annual three-day direct mail advertising exhibit and conference. Billy B. Van, Marshall Adams and J. E. Sieber are listed as speakers for each of the three days. There will be effective displays of direct-mail literature that has produced results and exhibits pertaining to the mechanics of direct mail production. In these latter exhibits Chicago Paper firms will probably take a part.

A Chicago paper firm, the Cromwell Paper Company, has been appointed exclusive selling agent for the position sheets made by the Printing Position Sheets Company and the sheets are to be known to the trade as Cromwell Position Sheets. They are designed as a means to check positions of forms, setting guides and to otherwise serve as an aid to printing. H. L. Williamson, for many years director of printing for the state of Illinois reports that the new sheets will be installed in all state institutions where printing is taught.

The Swigart Paper Company, 723 South Wells street, Chicago, has issued to the trade a complete catalog of Hammermill mimeograph papers containing the full line of mimeos, together with descriptions and price list for white or colors, either wove or laid. The paper comes in white, blue, pink and buff, in four stock sizes and weights and in laid and wove finishes. The swatch book contains samples of each stock and color, giving the buyer a complete description as well as an actual sample of the paper he is interested in.

TERRY



250 H.P. Terry driving new 202 in. Beloit paper machine at St. Helens Pulp & Paper Co. mill, St. Helens, Oregon.

New Flexibility
FOR YOUR PAPER MACHINE

The Terry Turbine Paper Machine Drive can be furnished to operate over any speed range up to 10 to 1.

High speeds and low speeds can be obtained without any change in the driving equipment. All speeds from minimum to maximum can be secured without steps.

Control of speed may be mechanical or electrical, and remote if desired.

Ask for descriptive bulletins.

The **TERRY** *Steam Turbine Co.*

TERRY SQUARE, · · HARTFORD, CONNECTICUT

TURBINES, GEARS SHAFT COUPLINGS

T-1092

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Escanaba, Mich.—The Escanaba Paper Company has completed construction of a new addition to its mill on the Escanaba River, near Escanaba, consisting of a two-story structure, 50 x 75 feet, and will occupy for expansion, particularly in connection with the production of newsprint stocks.

Corinth, N. Y.—The International Paper Company, 220 East 42nd street, New York, has made application to the Board of Village Trustees for flowage rights on Hudson River, vicinity of Pagenstecher Park, to be used in connection with a proposed industrial and power development in this district. It is planned to construct an artificial lake from the Hudson River dam to Luzerne, about 9 miles distant, for water storage for a hydroelectric power plant. The present Hudson River dam and Curtis Mill dam will be eliminated. Entire development is reported to cost over $2,000,000.

New York, N. Y.—The Central Paper Company, Muskegon, Mich., has filed notice of organization under Michigan laws to operate in New York, with capital of $300,000. Eastern headquarters will be at 122 East 42nd street. C. W. Smith is vice-president and general manager.

Stevens Point, Wis.—Wisconsin River Paper and Pulp Company, Neenah, Wis., has engaged W. G. Kirchoffer, 22 North Carroll street, Madison, Wis., engineer, to investigate water supply for mill at Stevens Point and make recommendations for installation of equipment for removal of iron and manganese, and for complete purification.

Tacoma, Wash.—The Standard Paper Company, South 21st and Pacific streets, has plans under way for extensions and improvements in storage and distributing plant, reported to cost about $20,000. Hill, Mock & Morrison, Perkins Building, Tacoma, are architects.

Marinette, Wis.—The Marinette & Menominee Paper Company, Marinette, sustained a fire loss at its local mill recently, totaling about $10,000. The damage will be replaced.

Grand Rapids, Mich.—The Grand Rapids Calendar Company, Grand Rapids, is considering the construction of a one-story addition to its paper converting plant, reported to cost over $20,000, with equipment. It is proposed to begin work early in the spring.

Kalispell, Mont.—According to W. B. Macdonald, local manager, Mountain States Power Company, a paper manufacturing interest, name temporarily withheld, is considering the construction of a pulp and paper mill in this vicinity. A site is being inspected in the vicinity of Flathead Lake. Proposed mill would be equipped for an initial capacity of 50 to 100 tons per day.

Indianapolis, Ind.—Louis R. Rosen, Indianapolis, formerly connected with the Standard Paper Company and the Capitol Paper Company, both of Indianapolis, has organized a new company under the name of the Acme Paper Company. Property has been leased at 1502 Madison avenue, and new organization will operate a storage and distributing plant at that location. Mr. Rosen will head the company.

Manistique, Mich.—The Manistique Pulp and Paper Company, Manistique, has resumed operations on increased basis in different departments of its mill and is now operating full in the grinding department for the first time in a year. The curtailment during the past twelve months has been due in part to lack of water power, but recent heavy rainfalls have increased the level of the Manistique River close to a normal point. Company will secure electric power for service at its mill, including grinding division, in the future, with the completion of the new transmission line of the Edison Sault Electric Company, Sault Ste. Marie, Mich., now being constructed from that point to Manistique. The power company has begun the building of an addition to its hydroelectric generating plant on the St. Mary's River, to double the present output, for power service at Manistique and other points. The power station and transmission line program will represent an investment of more than $1,000,000.

Canton, N. C.—The Champion Fibre Company, Canton, has asked bids from a number of contractors for construction of proposed impounding dam across the Pigeon River, near Sunburst, N. C., on the West Fork of the stream. The improvement will be used for water supply at the mill, which now has work in progress on an expansion and improvement program to cost over $1,000,000. The dam will be about 525 feet long and 50 feet high. It is proposed to award contract and begin work at an early date.

Boston, Mass.—The Paper Converting Company, Inc. recently organized with a capital of 5000 shares of stock, no par value, plans operation of a local converting plant for the commercial trades. William P. Yanes is president; Benjamin A. Feinberg, 53 Crawford street, Boston, is treasurer.

New York, N. Y.—The H. P. Andrews Paper Company, 104 Worth street, has leased the first and second floors and basement in building at 12-14 West Third street, corner of Mercer street, and will use for storage and distributing service, as well as company headquarters. It is understood that present establishment will be removed to the new location.

Glens Falls, N. Y.—The American Paper Machinery and Engineering Works, Inc., Glens Falls, recently organized with a capital of $60,000, will take over and succeed to the local company of same name, manufacturer of paper and pulp machinery, parts, etc., and will expand operations. Harold D. Wells, 41 Grant avenue, Glens

Falls, and Herman G. Rhode, Queensbury, N. Y., head the new company.

East Wilmington, Del.—The National Vulcanized Fibre Company, East Wilmington, has authorized an increase in capital from $700,000 to $800,000, and 25,000 to 46,000 shares of common stock, no par value, for general expansion.

New Companies

New York, N. Y.—The Princess Paper Box Company, Inc., has been incorporated with a capital of $10,000, to manufacture paper boxes and containers. The company will be represented by Nathan Zvirin, 250 West 57th street, New York, attorney.

Kansas City, Mo.—The Paper Supply and Cordage Company has been organized to deal in paper products of various kinds. The company is headed by Leslie C. Thurman, First National Bank Building, Kansas City.

New York, N. Y.—The M. & M. Paper Box Company, Inc., has been incorporated with a capital of $10,000, to manufacture paper and cardboard boxes and containers. The incorporators are Harry and Morris Kamens, 2131 Eastern Parkway, Bronx. Company is represented by Joseph Lew, 299 Broadway, New York, attorney.

Neenah, Wis.—The Atlas Tag Company has been incorporated by R. P. Dohr, F. F. Wheeler and M. M. Bacon, all of Neenah, to manufacture paper tags and kindred products.

New York, N. Y.—The Sun Paper Box Company, Inc., has been incorporated with a capital of 300 shares of stock, no par value, to manufacture paper and cardboard boxes and containers. The incorporators are Martin P. Brookner and Abraham Lillienthal, 10 East 40th street, New York. Last noted is company representative.

New London, Conn.—The New London Paper and Supply Company, Inc., has been incorporated with capital of $50,000, to deal in paper goods of different kinds, manufacture paper specialties. The incorporators are Jacob Rosen, Julius Daren and Morris Thall, all of New London.

Wilmington, Del.—The Delaware Paper Box Company, care of Joseph Handler, Citizens Bank Building, Wilmington, attorney, recently chartered under state laws with capital of 100 shares of stock, no par value, to manufacture paper boxes and containers. H. Eugene Savery, Wilmington, is one of the incorporators.

Grand Rapids, Mich.—The Sani-Seat Manufacturing Corporation has been incorporated with a capital of $1,000, nominal, to manufacture special paper products. The incorporators are Edwin D. Trosse and Howard L. Pearl, 356 Brainard avenue, Grand Rapids.

Hercules Experiment Station Described

The splendid new Research and Experiment Station of the Hercules Powder Company is ably described and profusely illustrated in an artistic booklet just published by the company. The new station occupies a commanding hill-top site on a plot of approximately 300 acres in the rolling country-side at Hercules, about five miles west of Wilmington. It consists of a group of eleven buildings, the central structure being a main laboratory building which is served by a group of semi-plant units, shops, and smaller laboratories.

These new facilities represent the achievement of a long felt desire on the part of the Hercules management to provide permanently for the company's growing research requirements. They are the result of careful planning by Hercules officials, actively headed by the company's president, R. H. Dunham.

New York Trade Jottings

William L. Batt, president of the S. K. F. Industries, Inc., New York, has been nominated for re-election to the office of vice-president of the Swedish Chamber of Commerce of the U. S. A.

* * *

American Paper Tube Products Corporation has been incorporated under the laws of the State of New York with a capital stock of $20,000. M. Meyer, of 10 East 40th street, New York, was the attorney.

* * *

Frederic Shepherd, New York City sales manager for Safepack Mills, Millis, Mass., with headquarters at 46 Great Jones street, will be back on the job next week after a successful operation for appendicitis.

* * *

R. B. Wolf, general manager of the Pulp Division of the Weyerhaeuser Timber Company, at Longview, Wash., who has been visiting the East in the interest of his organization, returned to the Pacific Coast last week.

* * *

G. A. Ware, formerly with the News Print Service Bureau, who is at present engaged in special accounting work for the Racquette River Paper Company, at Potsdam, N. Y., spent the Yuletide holidays in New York City.

* * *

J. A. C. Kavanagh, Director of the Statistical Department of the American Paper and Pulp Association, has returned to New York after having attended the convention of the American Economic Association and the American Statistical Association in Washington, D. C.

* * *

Empire Box Corporation, of South Bend, Ind., recently opened Eastern sales offices at 1614 Lincoln Building, New York. Telephone Murray Hill 2—8814. The offices were opened simultaneously with the commencement of operations at the new plant of the company in New Brunswick, N. J. C. H. Andrews, sales representative of the company, is optimistic over the outlook and declares that his organization expects to do about half a million dollars worth of business this year.

* * *

The weekly luncheons and meetings of the Eastern Division of the Salesmen's Association of the Paper Industry were resumed on Tuesday, at George's Restaurant, New York. A. J. Stewartson, former head of the Wrapping Paper Service Bureau, was the guest speaker. Mr. Stewartson returned to this country only recently from a lengthy trip abroad during the summer and autumn, when conditions were at their most critical point. He visited Germany, Czecho-Slovakia, Belgium and England during his business mission and related his many experiences and impression of conditions abroad. His instructive and illuminating talk was thoroughly enjoyed and appreciated by all present.

I. P. Mill at Glens Falls May Reopen

GLENS FALLS, N. Y., December 21, 1931.—Rumors continue that the South Glens Falls plant of the International Paper Co. is to be reopened in the near future and a prominent business man in close touch with conditions is authority for the statement that indications point to a resumption of operations. According to gossip, it is planned to manufacture some other product than news print, possibly book paper. It is understood that over 200 workers will be employed if the plant resumes activities. The plant suspended operations about two years ago.

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COMING EVENTS

American Paper and Pulp Association, fifty-fifth Convention and Meeting. Pennsylvania Hotel, February 15-18. Annual Meeting, Thursday, February 18. Annual Banquet, Grand Ball Room, Thursday, February 18.

National Paper Trade Assosciation of the United States. Convention, Pennsylvania Hotel, February 15-17. Luncheon, Wednesday, February 17.

Technical Association of the Pulp and Paper Industry. Convention, Pennsylvania Hotel, February 15-18. Luncheons, Wednesday, February 17 and Thursday, February 18.

Salesmen's Association of the Paper Industry. Annual Meeting, Pennsylvania Hotel, Tuesday, February 16. Luncheon, Tuesday, February 16.

New York Association of Dealers in Paper Mills' Supplies, Annual Banquet, Hotel Commodore, Wednesday, February 17.

Canadian Pulp and Paper Association. Annual Meeting, Pulp and Paper Research Institute, Montreal, January 27-29.

PAPER WEEK, FEBRUARY 15-18

The fifty-fifth annual paper week of the American Paper Industry will be held at the Hotel Pennsylvania February 15, 16, 17 and 18. The American Paper and Pulp Association, the Technical Association of the Pulp and Paper Industry, the National Paper Trade Association and numerous other paper associations will hold their annual conventions and New York will, as usual, during the week be filled with paper men from the various sections of the pulp and paper industry from all over the country.

Owing to the unusual conditions prevailing in the paper business, paper week this year will, it is expected, be one of the most important ever held in the history of the paper industry. In announcing the convention of the American Paper and Pulp Association, Jesse H. Neal, general manager, has sent out an inspiring notice which in part is as follows:

"Going back through the long and notable history of the American Paper and Pulp Association, one is impressed by the fact that some of the most fruitful meetings were held during periods of storm and stress and trial. In fact the disturbed conditions of business in the seventies were directly responsible for the first meeting of the Association at Saratoga Springs in the year 1878.

"Curiously enough, a boom began shortly after that first meeting during which prices rose and the capacities of the mills were strained to meet the demand. In the recession which followed two years later, however, news print fell to the ruinous price of $130 a ton.

"In January 1895 the association met at old Delmonico's in New York. The members were shrouded in gloom and pessimism for they had back of them over two years of poor business. Col. A. G. Paine who was then president, made the definite statement that the bottom had been reached and an upturn was imminent. Within a few months business was climbing back to normal.

"These were coincidences of course, but it is not impossible that the best minds of the industry in serious conference at our forthcoming meeting, may be able to contribute something towards creating another coincidence.

"To that end, the sessions, the speakers and the subjects, will be attuned to the times. It will be a "brass tacks" convention, a reconstruction conference that will attempt to ferret out causes, and to apply prophylactics as well as remedies. Come prepared to do your share and to absorb new hope and courage.

"Fare and one-half rates will apply on all railroads. Members will make their own hotel arrangements. Annual dinner on the night of the 18."

PAPER DEMAND RELATIVELY GOOD

Paper has been maintaining a relatively more satisfactory position than commodities in most lines of industry. Mr. Archibald R. Graustein, president of the International Paper Company, emphasizes this point in a specially prepared article printed on Monday morning of the week in the New York *Herald-Tribune*.

"Throughout the present serious economic disturbances demand for paper has shown relative stability in comparison with the decline in consumption generally," says Mr. Graustein. "Production of paper and paperboard in the first ten months of 1931 decreased by about 10 per cent, while industrial production as a whole decreased by about 15 per cent.

"The paper industry has, however, been unable to derive full benefit from its relatively stable market owing to a large excess of productive capacity. The rapid increase in demand for all grades of paper during the past decade resulted in an era of large-scale mill construction. Under normal conditions of demand the burden of excess capacity would be supportable, but under present conditions the load is too heavy and the factors of overcapacity, subnormal demand and low prices have combined to make it difficult for the paper industry to earn a fair return on invested capital.

"Economic forces are gradually bringing about readjustments to correct the present condition. Mills built during the last five to ten years, generally speaking, have

wide advantages in cost over the older mills. Supervision of production at these modern mills has resulted in reducing costs to an extent considered impossible a year or two ago. At today's level of prices many of the older mills are no longer competitive.

"New and specialized uses for paper have solved the question for some of these older mills. Others have been scrapped and their appurtenant water powers have been developed hydro-electrically.

"In the industry today, however, there would be a real excess of effective capacity even after the complete elimination of the non-economic mills. A return to normal general business conditions should be accompanied by increasing demand which would go far toward absorbing this overcapacity.

"For the future the industry must depend for profits on the greater return from increased production and stabilization of prices which will be possible when the demand more closely approximates effective capacity."

Awards in Accident Prevention Contest

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., January 4, 1932—Several firms in this section are among the winning contestants in the annual state-wide accident prevention contest sponsored by Associated Industries which ended late in November. Among those that will receive awards are Finch, Pruyn & Co. and the Glens Falls Paper Products Company. The campaign started last August when 1,450 concerns employing about 280,000 manual workers enrolled. The supervisory committee reports that a low accident frequency figure was maintained throughout the contest. The campaign of 1930 resulted in the establishment of a new mark of 13.8 accidents per million man-hours worked and this figure was increased only slightly in the latest drive, the rate being slightly in excess of 14 accidents per million hours.

A new high figure for the number of entrants was established in the campaign but curtailed schedules in some plants caused a decline in the number of employees exposed and the number of hours worked. Reports, nevertheless, show that these 280,000 manual workers completed a total of 141,000,000 man-hours as against 162,000,000 hours worked by 307,000 employees in 1930. Eight deaths were reported from accidents in the 1931 campaign while fifteen occurred in the 1930 contest.

May Break Up Ground Wood Cartel

WASHINGTON, D. C., January 4, 1932.—A report has reached the Department of Commerce that reports continue that the inter-Scandinavian ground wood cartel will be broken up due to very inefficient cooperation between the various Scandinavian and Finnish mills. The agreement was first cancelled by Norway since not all exporters in that country belonged to the cartel, and thus rendered the work of the cartel very difficult and ineffective in that country. However, the Norwegians seemed to be close to an understanding when the largest Swedish producer announced its intention of leaving the cartel. Since this company produces about 30 per cent of the total Swedish output of ground wood, the effect of its withdrawal from the cartel is readily apparent. At a recent meeting of the Swedish Wood Pulp Association, the agreement was cancelled, to take place April 1, 1932.

Add Fine Paper Department

MINNEAPOLIS, Minn., January 4, 1932.—The Minnesota Paper and Cordage Company of Minneapolis, opened the New Year with the addition of a fine paper department. E. O. Turnquist, president and general manager, started this business about nine years ago and up to this time, the company has engaged principally in the sale of coarse

E. O. TURNQUIST

papers and twine, although they have handled a few items of fine papers.

The addition of printing papers to their lines comes as a natural growth in the development of the wholesale paper field.

W. C. Wilson, for many years identified with the paper industry in Minneapolis, is in charge of the new department.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., January 6, 1932—The Government Printing Office received the following bids for 40,000 pounds of No. 2 binders board; Mathers-Lamm Paper Company, at 2.9975 cents per pound; R. P. Andrews Paper Company, 3.1 cents; Whitaker Paper Company, 3.1 cents; and Consolidated Paper Company, 3.1 cents.

The following bids were also received for 5,260 pounds of pink sulphite index paper; Dobler & Mudge, at 8.25 cents per pound; R. P. Andrews Paper Company, 6.75 cents; Virginia Paper Company, 8 cents; Whitaker Paper Company, 11.75 cents and 9.25 cents; Old Dominion Paper Company, 7.19 cents; and Aetna Paper Company, 6.97 cents.

Bids received for 5,588 pounds of No. 80 colored sulphite ledger paper were as follows; Dobler & Mudge Paper Company, at 10.75 cents and 8.25 cents per pound; Whitaker Paper Company, 11.75 cents and 9.25 cents; R. P. Andrews Paper Company, 6.75 cents; Aetna Paper Company, 8.13 cents; and Virginia Paper Company, 8 cents.

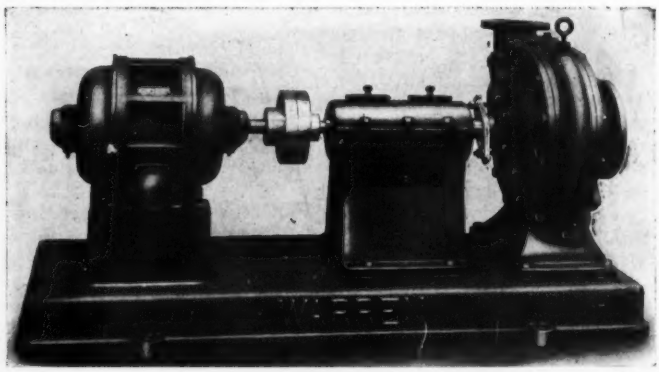
E. B. Eddy Co. Improvements

New units are contemplated for erection next year at the plant in Hull of the E. B. Eddy Company, Ltd., according to statements made by officials of the organization. A new filtration plant costing $425,000 was completed in October last and the company plans to make further extensions during 1932.

WARREN STUFF PUMPS

help cut the high cost of stock system shut-downs

With Warren Stuff Pumps in your mill you can eliminate profit-wasting shut-downs and keep your stock system running smoothly at all times.



Warren stuff pumps, built to handle 6% clean stock, smoothly, efficiently and without clogging.

WARREN STEAM PUMP COMPANY, Inc.
WARREN . . . . . MASSACHUSETTS
AGENCIES IN ALL PRINCIPAL CITIES

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Calibration of the Elmendorf Tearing Tester*

By James d'A. Clark[1]

The instruments considered are the Thwing-Elmendorf tearing tester[2] in general use in the U. S. A., Canada and elsewhere and the Marx-Elmendorf tearing tester used extensively in Great Britain and elsewhere.

The calibration is performed as follows: The instrument is leveled and adjusted on a level sheet of plate glass and a known weight W grams, the center of gravity of which is marked with a punched dot, is clamped to the radial edge of the sector beneath the jaws. The sector is raised and set as for proceeding with a tearing test and by means of a surface gauge or other convenient means the height of the center of gravity of the weight above the glass plane is measured as h centimeters. The sector is then released, allowed to swing and the pointed reading noted. Without touching the pointer the sector is raised until the edge of the pointer just meets with its stop in which position the height of the center of gravity of the weight above the glass plate is again determined as H centimeters.

The work done = W(H-h) gram centimeters.

If f is the average force in grams to tear a single sheet of paper through 4.3 centimeters (d) in the case of the Thwing instrument and 4.4 centimeters (d) in case of the Marx instrument, then the work done also equals 2fd because clearly the tearing force has to be applied through twice the distance through which the paper is torn and not through the distance of the tear itself, as was erroneously assumed in the calibration of the first Elmendorf tester and subsequently in a paper by Mallett and Marx[3].

Equating these values $W(H-h) = 2fd$ gram centimeters

whence $f = \frac{W(H-h)}{2d}$ grams.

If the instruments were designed for tearing a single sheet f should equal the pointer reading r. However, the Thwing instrument is calibrated so as to read the force required to tear sixteen sheets at one time through 4.3 centimeters or through a total tearing distance of 68.8 centimeters whence r should equal

$\frac{W(H-h)}{2 \times 68.8} = \frac{W(H-h)}{137.6}$ grams.

The Marx instrument is supposedly calibrated so as to read the force required to tear a single sheet when making a double tear through six sheets at a time, each tear being through 4.4 centimeters but in fact it is calibrated as has been explained, so as to read the force to tear a single sheet when making a double tear through three sheets at a time, each tear being through 4.4 centimeters or through only a total tearing distance of 26.4 centimeters whence r should equal $\frac{W(H-h)}{2 \times 26.4} = \frac{W(H-h)}{52.8}$ grams.

Test Data

The following are some specimen experimental results obtained:

Thwing Instrument W(H-h) 137.6				
W (grams)	(H-h) Cms.		Pointer Reading	Correction
76.5	12.55	6.9	7.0	—0.1
76.5	36.35	20.4	20.0	+0.4
224.5	30.80	50.3	50.5	—0.2
455.5	26.40	87.6	87.0	+0.6
607.0	22.20	98.2	98.0	+0.2

Marx Instrument W(H-h) 52.8				
W (grams)	(H-h) Cms.		Pointer Reading	Correction
35.3	13.80	9.2	10.0	—0.8
76.5	12.95	18.8	20.0	—1.2
224.5	11.90	50.6	50.5	+0.1
224.5	20.50	87.3	84.5	+2.8
301.0	18.70	106.2	102.0	+4.2

The above mentioned method is accurate and takes into account the energy stored and released by the pointer during the action of the instrument. The weight of paper held in the moving jaw is the only factor not included in the reading. This would require an average correction in the reading of about + 0.2 per gram of paper held in the moving jaw for the Marx instrument and about + 0.08 for the Thwing instrument and in consequence is almost negligible.

The results show that the readings are comparable if a double tear is made through 4.4 centimeters on three sheets of paper in the Marx instrument and a single tear through 4.3 centimeters on sixteen sheets of paper in the Thwing instrument, there being a small but appreciable correction factor to be applied in the case of the particular Marx instrument which was calibrated.

Additional factors which would arise in a strict comparison are first, that when a number of sheets are torn together the edges of the sheets rub against the others as the tear proceeds, requiring an average force proportional to N(N-1) where N is the number of sheets and partially explains why doubling the number of sheets torn together in a tearing tester gives rather more than double the previous reading.

Secondly, the recorded readings also include the average force to perform the work of bending the sheets in the jaws as the tear proceeds. The average bending force exerted depends not only on the rigidity of the paper but also on the width of the specimen clamped in the jaws which, in consequence, should be maintained a constant. This normally differs in current practice for

* To be presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 15-18, 1932. Written discussion will be welcome and should be sent to B. W. Scribner, chairman, TAPPI paper testing committee, Bureau of Standards, Washington, D. C. Contribution of the TAPPI paper testing committee.

[1] Member TAPPI, development engineer, The Mead Corporation, Chillicothe, Ohio.

[2] Tearing strength test for paper—A. Elmendorf, Paper 25, P. 302, April 21, 1920.

[3] The Calibration of the Elmendorf Tearing Tester—Mallett and Marx, Proc. Tech. Sect. P.M.A.—Vol. IV—Part, March, 1924.

the two instruments. Moreover, in the Marx instrument the cut ends of the specimens are clamped at right angles whereas in the Thwing instrument they are clamped in the same plane. This results in slightly more work expended in bending the paper during a test in the latter instrument.

Finally, the practice of making a double tear for the test in the Marx instrument may introduce an error due to the possible continuous wedging action of the edges of the outer sheets being torn, into the edges of the inner sheets immediately following the course of the tear especially if the distance between the two tears is small. For this reason it is preferable not to use the double tear in the Marx instrument but to tear six sheets singly for a direct reading.

Summary

A simple and accurate method is described for calibrating dynamic tearing testers with examples for the Thwing and Marx-Elmendorf tearing testers. The differences in results given by the two instruments are discussed and it is noted that the Marx instrument at present is not calibrated so as to give grams force to tear a single sheet when six double tears are made as recommended by the makers but half that number, or six single tears, should be made to obtain a direct reading.

Current Paper Trade Literature

Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts and Bibliography of the Technical Association of the Pulp and Paper Industry

Clarence J. West, Chairman

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Sulphite Process

High-Alpha-Cellulose Fiber. George A. Richter assignor to Brown Co. U. S. pat. 1,802,575 (April 28, 1931).—Sulphite pulp admixed with a solution of caustic soda (containing about 1 to 1.5 times as much caustic soda as the weight of dry fiber) is treated to a stock consistency of about 5 to 6 per cent at about room temperature for 30 min. to 2 hrs.—A.P.-C.

High-Alpha-Cellulose Fiber. George A. Richter and Milton O. Schur assignors to Brown Co. U. S. pat. 1,801,782 (April 21, 1931).—Pulp prepared by the sodium bisulphite cooking process is thickened and mixed with an alkaline digesting liquor (such as caustic soda solution) to secure a substantially uniform suspension of pulp in the liquor, and this suspension is suitably thickened and subjected to digestion. Calcium hypochlorite is used for bleaching.—A.P.-C.

White Wood Pulp for High Grade Paper Manufacture. George A. Richter assignor to Brown Co. U. S. pats. 1,809,286 and 1,809,287 (June 9, 1931).—*No. 1,809,286*—Kraft pulp is digested in an open tank at an elevated temperature in an acid sulphite liquor containing free sulphur dioxide in such quantity (but not exceeding the combined sulphur dioxide) that the ligneous material is removed without appreciably acting on the pentosans, so as to maintain the strength of the pulp practically unimpaired. The pulp may be bleached, yielding a product having a bursting strength, fiber length and tear resistance equal to that of ordinary kraft pulp, and a color equal to that of ordinary bleached or superbleached sulphite pulp. *No. 1,809,287*—Kraft pulp is subjected to the action of chlorine water or to hypochlorite bleach liquor, or to both successively. After washing, the pulp is treated with an alkaline liquor similar to the cooking liquor used in the kraft process. The pulp is then washed again, at which stage it has a lignin content of from 1 to 1.5 per cent as against 5 to 7 per cent in the raw kraft pulp. The pulp is finally bleached with a permanganate solution.—A.P.-C.

New Methods for Improving the Quality of Pulp. W. Schmid. Papier-Fabr. 29, No. 23A: 48-52 (June, 1931).—The importance of quick acid penetration in the cooking is shown. The advantages of forced circulation are enumerated, such as, higher yield, better quality pulp, cost less, etc. The new methods of drying are discussed, especially that using warm air. The improvement of quality and the economies effected by this drying process are enumerated.—J.F.O.

Decomposition of Woods Rich in Rosin, According to the Bisulphite Process, and the preparation of cellulose of highest purity for the manufacture of artificial silks, aceto and nitro cellulose. Wochbl. Papierfabr. 62, No. 17: 403 (April 25, 1931). —Description of the process for the manufacture of a pulp, suitable for all the common uses of pulp from spruce wood, out of pine wood, according to Bergstrom and Zennstrom. The wood is pre-cooked and drenched with hydrates of two atom earth metals, with weak alkali or a mixture of both, which has for its purpose the removal or dissolving of the rosin and fat of the pine wood. The wood chips are then treated with sulphite compounds or chlorine compounds and after this treatment the wood is subjected to an ordinary sulphite cook whose total time is about twenty-five per cent longer than usual. The recovery of by-products is also discussed.—J.F.O.

Bleached Wood Pulp. Ernst Elgerus. U. S. pat. 1,811,783, (June 23, 1931).—Wood is treated for several hours at superatmospheric pressure with hot waste sulphite liquor pumped directly from the digester without employing any heat other than that contained in the liquor, and the treated wood is then subjected to mechanical disintegration in an edge mill or the like. —A.P.-C.

Study of the Use of Sulphite Waste Liquor as a Material for Laying Dust. E. Remy. Arch. Hyg. 105: 97-100 (1930).—Sulphite waste liquor combines with large amounts of street dust. Dilutions of the preparations do not injure the skin and eyes of guinea pigs. Its use on streets appears to have no harmful effects.—A.P.-C.

Dispersing Dyes with Sulphite Pitch. James Baddiley, Arnold Sheperdson and Anthony J. Hailwood assignors to British Dyestuffs Corp. U. S. pat. 1,812,675 (June 30, 1931).—A composition readily dispersed in water comprises a dye paste or powder and the product of the moderate oxidation of sulphite cellulose pitch with nitric acid.—A.P.-C.

Products Suitable for Dispersing Dye from Sulphite Pitch. Anthony J. Hailwood assignor to British Dyestuffs Corp. U. S. pat. 1,812,693 (June 30, 1931).—Sulphite pitch is treated under pressure with ammonia solution at temperatures above 110 deg. C., and the product may be improved in color by boiling with caustic soda and zinc dust.—A.P.-C.

Sulphite Alcohol Production and Consumption in Sweden. Wochbl. Papierfabr. 62, No. 28: 668-669 (July 11, 1931).—The report contains tables for the production of sulphite alcohol in Sweden as well as the amounts sold as denatured alcohol, for drinking purposes and for automobiles. The consumption

of alcohol for automobiles has increased from 170,000 liters in 1922 to 7,600,000 liters in 1930. The physical and chemical properties of sulphite alcohol and that prepared from potatoes are compared.—J.F.O.

Miscellaneous Digesting Processes

Process for the Decomposition of Materials Containing Cellulose, such as Wood, Straw and Similar Materials. I. G. Farbenindustrie A. G. Frankfurt. Ger. pat. 514,856 (Aug. 14, 1926).—Addition to Ger. pat 500,567. In carrying out the process according to the original patent, number 500,567, the fiber is impregnated with dilute nitric acid and after separation of the unused acid, it is then treated with air. For example, spruce wood which has been steamed, is digested with a cold 10 per cent solution of nitric acid until it is completely soaked. then the acid is removed by decantation and the pulp is then treated in a pipe or tower with air at 50 deg. until a sample taken shows it to be completely decomposed. The further processing is carried out in the usual manner.—J.F.O.

Process for the Removal of Incrustants from Materials Containing Cellulose. Chemische Fabrik Pott & Co., Dresden. Ger. pat. 514,083 (Aug. 26, 1926).—The material containing the cellulose is treated with an aqueous solution of chlorinated aromatic sulpho-acids along or in combination with hydrocarbons, alcohols or ketones. For example, 1,000 grams of unbleachable sulphite pulp is cooked for 1½ hours in a solution of 200 grams chlorinated isopropyl-beta-naphthaline sulphoacid in 10 liters of water. The liquid is drained off and the pulp is washed well with water and then treated with 1 per cent sodium hydroxide or soda solution at 50 deg. After washing to neutral, the pulp is bleached in the usual manner.—J.F.O.

Process for the Decomposition of Plant Fiberous Materials by Means of Chloric Acid. I. G. Farbenindustrie A. G., Frankfurt. Ger. pat. 512,927 (May 22, 1927).—The decomposition liquid is a solution of easily soluble chlorate with small quantities of hydrochloric acid which act as a catalyser. For example 50 parts by weight of spruce wood is treated with 600 parts by weight of 25 per cent calcium chlorate solution to which is added 50 parts by weight of concentrated hydrochloric acid; for 18 hours at 30 deg. and after complete washing away of the calcium salt; the remainder of the process is carried out in the usual manner. Concentrated chlorid solutions may be used to dilute the chlorate solution.—J.F.O.

Billwiller Cooking Process. Zellstoff Papier 11, No. 4: 198 (April, 1931).—Comment on the Billwiller cooking process which produces a well cooked pulp in a very short cooking time by the use of dilute ammonia. In order to prevent the ammonia gas from remaining at the top of the digester at high temperatures, the material being cooked is kept in constant agitation by stirrers. Spruce wood is cooked at 220 deg. C. and at 22 atmospheres for 15 to 20 minutes with a 2 per cent ammonia solution.—J.F.O.

Treatment of Pulp and Product Thereof. George A. Richter and Milton O. Schur, assignors to Brown Co. U. S. pat. 1,806,309 (May 19, 1931).—Pulp, particularly high alpha pulp, is digested with a saponaceous reagent to effect dispersion on colloidal solution of the resins, specks, and other impurities adsorbed mainly by the short-fibered portion of the pulp. The purified pulp is then classified into long-fibered and short-fibered portions, and, owing to the preliminary treatment, the short-fibered portion is substantially as white and stable as the long-fibered portion.—A.P.-C.

Manufacture of Cellulose. Karl Ott and Heribert Schuessler assignors to I. G. Farbenindustrie Aktiengesellschaft. U. S. pat. 1,806,703 (May 26, 1931).—Non-ligneous vegetable material containing incrusted fibers, such as chopped barley straw or esparto, is treated with an alcohol such as ethanol or benzyl alcohol, in the presence of an acid medium such as ethyl chloride or hydrochloric acid, in order to effect alcoholysis of the lignin.—A.P.-C.

Process for the Manufacture of Cellulose. Albert E. Nielsen. U. S. pat. 1,816,739 (July 28, 1931).—The patent covers a pulping process by indirect steaming with circulation of the liquor through a heat exchanger placed outside the digester. As cooking proceeds concentration of the liquor is effected by a gradual vaporizing in the heater, the waste vapor from each concentrating apparatus being used for heating the digester which are connected in series, the first concentrating device being connected to the digester in which the temperature is the highest and the last concentrator being connected to the digester in which it is lowest.—A.P.-C.

Fermentation Process for the Production of Cellulose. Arthur M. Buswell and Clair S. S. Boruff. Fr. pat. 700,200 (Aug. 8, 1930).—Cellulosic materials such as cornstalks or bagasse are made suitable for the production of paper and the recovery of methane by boiling or steeping and submitting them to the action of anaerobic bacteria in the absence of oxygen, collecting the gas produced and washing the solid residue.—A.P.-C.

Process for Isolating Cellulose. Thordor Kleinert and Kurt Yauenthal. Fr. pat. 704,698 (Oct. 25, 1930).—Alcohol and water having a content of 20 to 75 per cent of water are used for the digestion or dissociation of fibrous vegetable substance, to obtain simultaneously cellulose and the incrusting materials. The treatment is carried out under pressure at above 150 deg. C. Substances having an acid or basic reaction may be added in amount less than 0.1 per cent of the digestion agent.—A.P.-C.

Process for Obtaining a Product Rich in Cellulose and Useful By-Products from Straw. Henri du Boistesselin assignor of one-half to Maurice Hurel. U. S. pat. 1,813,531 (July 7, 1931).—Straw is treated at 80 to 85 deg. C. for about 3 hours, without passing through a grinder and without crushing the nodes, with normal nitric acid. The cooked straw, retaining substantially the appearance of the original straw, is reduced to sheet form, and defiberized by slow boiling in an alkaline carbonated solution and then in water until a raw pulp is obtained, which is subsequently bleached by any of the usual processes. Various valuable by-products can be obtained from the waste liquors.—A.P.-C.

Beating

Pulp Beating or Refining Machine. Thomas D. Nuttall assignor of one-half to Bentley and Jackson, Ltd. U. S. pat. 1,814,452 (July 14, 1931).—The conical housing or casing of the jordan is divided axially into two sections adapted to be bolted together with the abutting parts of the two halves diametrically opposite to one another and extended radially outwards, the extended parts being carried on suitable pedestals or brackets, one on each side of the machine. As the division of the casing is along a diameter, either portion of the casing may be placed in the top or the bottom position. Supporting the casing upon the flanges resting upon the brackets, the pedestals form guides for the casing during horizontal adjustment by means of a hand wheel and worm wheel, the casing thus being moved for adjustment relative to the plug instead of moving the latter relative to the casing and base.—A.P.-C.

Pulp Refining Apparatus. Fred H. Daniels assignor to Riley Stoker Corp. U. S. pat. 1,814,587 (July 14, 1931).—In the usual pulp refining apparatus, with one stationary and one rotating stone, the pulp and water have been introduced near the axis of the machine and passed outwardly in the direction of centrifugal force. With the construction provided for in this patent the pulp and water are fed at the periphery of the stone and the stream flow inwardly toward the axis of the stones. It may be aided against the action of centrifugal force by suitable means such as a suction connection to the discharge side of the machine, or by a static head of water and pulp connected to the inlet.—A.P.-C.

Studies on the Beating of Pulp. XIII. The Influence of Water of Imbibition Upon the Physical Properties of Paper. Michimaro Nakano. Cellulose Indi (Tokyo) 6: 183 (1930).—Water of imbibition in materials increases the bursting strength, the transparency and the self-sizing degree, and decreases the

absorbency and the thickness of paper sheets made from them. —A.P.-C.

Jordan Engine Plug. Harry N. Weir assignor to The Noble and Wood Machine Co. U. S. pat. 1,814,879 (July 14, 1931).—In the jordan plug covered by the patent there is provided a cast renewable section for the front, or small, end of the plug. It is conical shaped and has a notched flange which fits over the notched ends of the knives of the main portion of the plug. This section is preferably made of cast manganese steel, but may be constructed of any suitable material that is hard, tough and durable. Forming an integral part of the casting are blades which align with the fly bars of the main body of the plug when the conical head is bolted thereto. As the stock is fed at the small end of the jordan, the brunt of the wear resulting from hard material in the stock is sustained by the hard cast section, which may be easily removed and replaced.—A.P.-C.

Beater Engine. William V. Knoll assignor to Midwest-Fulton Co. U. S. pat. 1,815,007 (July 14, 1931).—The invention relates to means of progressively transferring from one beater engine to another pulp which has been reduced to the required condition. Back of the roll is a vertically adjustable deflector plate. The coarser portions of stock pass between the backfall and deflector and continue circulating around the trough, while the finer portions are carried around by the roll, under the deflector plate, and are thrown off by centrifugal force into a receiving compartment or pan, whence they are delivered to a succeeding beater to be further reduced—A.P.-C.

Method of and Apparatus for Refining Pulp. George Holmes Carnahan assignor to Rubber Surfacers, Inc. U. S. pat. 1,827,279 (Oct. 13, 1931).—The stock is subjected to a combined squeezing and rubbing treatment in a kollergang having contacting roll and bed plate surfaces, one at least of these surfaces being of substantial thickness and resilient and yieldable, so that the material is subjected to the squeezing and rubbing action of the contacting surfaces having a substantial area of surface yieldably contacting with each other.—A.P.-C.

Method of and Apparatus for Treating Pulp. George Holmes Carnahan assignor to Rubber Surfacers, Inc. U. S. pat. 1,827,280 (Oct. 13, 1931).—The invention consists of a stamping machine for pulp, comprising a mortar and stamps, one at least of which is provided with yielding resilient stamping elements adapted to beating the fibers passing between the mortar and stamps by a rubbing, crushing and kneading action without substantial cutting action.—A.P.-C.

Beater Bar. Frank M. Gloyd assignor to Simonds Worden White Co. U. S. pat. 1,827,228 (Oct. 13, 1931).—The beater bar is traversed from front to rear by a series of holes adapted to serve as vents to prevent air from being pocketed in spaces between adjacent bars in the beater roll, the holes being isolated from the working edge of the bar.—A.P.-C.

Beater. Walter J. Zimmerman assignor to The Mead Research Engineering Co. U. S. pat. 1,826,857 (Oct. 13, 1931).—The beater roll is mounted in the tub on a vertical axis and is driven by a direct-connected motor placed above the roll—A.P.-C.

Apparatus for Preparing From Waste Paper Pulp Ready for Delivery to the Paper Machine. A Kuhn. Belg. pat. 374,142 (Nov. 30, 1930).—The material from the breaker beater or disintegrator is delivered continuously through a rotating float valve to a screw press or to a suction filter drum, from which it passes to a machine in which it is subjected to a friction or rubbing action; and finally the material is discharged into a mixer.—A.P.-C.

Continuous Beater. J. Weibel. Belg. pat. 374,688 (Dec. 31, 1930).—Just back of the backfall is a rotating screen roll. The stock that has been reduced to the required size passes inside the roll and is discharged through a suitable outlet.—A.P.-C.

Beating Engine. E. Héry. Belg. pat. 373,660 (Oct. 31, 1930).—The bedplate is mounted about or slightly above the level of the axis of the roll. The latter is rotated in a direction opposite to that in general use. Through the action of centrifugal force the stock leaves the roll immediately after it has passed the bedplate and is deflected by the hood either over the roll or over the bedplate. Only a sufficient portion of the roll is exposed to the oncoming stream of stock to ensure proper filling of the spaces between the fly bars with stock and to avoid useless frictional contact between the roll and stock.—A.P.-C.

Consistency Responsive Device for Beaters. Sidney E. Meyers assignor of one-half to Ericsson H. Merritt. U. S. pat. 1,810,111 (June 16, 1931).—As the slope between two points in the line of flow of the stock in the beater is proportional to the internal friction between the solid particles suspended in the stock circulating in the tub, which friction increases with the amount of such particles present, the slope is a true function of the consistency. The patent covers a device for measuring the difference in height at two points in the tub. Floats are suspended freely in guard pipes placed at two points on opposite sides adjacent to one end of the midfeather, so that they are protected against the velocity of the stock and respond accurately to the difference in hydraulic levels at the points selected. The floats are suspended by flexible cables connected with a differential-responsive device. The latter may bear a chart or indicating device giving a reading of the difference in level, or the equivalent in stock consistency; or it may be arranged to control the consistency of the stock by actuating a valve which is adapted to admit or shut off a supply of water to the tub.—A.P.-C.

Machine for Refining Paper Pulp. Ludwig H. Wessel and Homer N. Booker assignors to Hermann Manufacturing Co. U. S. pat. 1,806,272 (May 19, 1931).—In order to facilitate the handling of the jordan filler and increase its strength, it is constructed of a number of relatively short units, each made up primarily of a number of knives and spacers, a ring clamp and a wedge, together with a suitable anchor bar. The assembling in the machine shop is accomplished by the use of frustoconical forms or jigs, in which the parts are assembled, after which they are held by the ring clamps, a relatively narrow portion or lip on the end of each blade being bent over the ring clamp after all parts have been placed securely in position. A fusible metal is then poured to secure the ring clamp and other parts.—A.P.-C.

Continuous Beater. Benjamin M. Bishop assignor to Terre Haute Paper Co. U. S. pat. 1,811,741 (June 23, 1931).—A section of the wall of the trough adjacent to the backfall is made of screen, which is curved and takes approximately the same shape as the wall of the trough. A deflecting plate is mounted above the backfall and another deflector plate is hinged to the midfeather to deflect the pulp from its rotary course in the beater through the screen.—A.P.-C.

Device for Making Groves in Raffineur Stones. Wochbl. Papierfabr. 62, No. 28: (July 11, 1931).—The cutting of the grooves in the raffineur stones by means of a pointed hammer is tiresome and requires too much time. The construction and operation of a special device to do this work is given.—J.F.O.

Method of and Means for Disintegrating Pulp Stock. Harry Liebeck assignor to Scott Paper Co. U. S. pat. 1,815,308 (July 21, 1931).—The patent provides a disintegrating machine for handling pulp on a large scale, breaking up the bales and separating the fibers so that the pulp is ready for the head box of the paper machine or for treatment in further beating and refining apparatus. The apparatus comprises a large tank, preferably of concrete, with filled corners to prevent the pulp being held in corner pockets. In the center of the top is an intake hole for receiving the bales of pulp. Water is admitted continuously to replace that which is being continuously withdrawn through screen plates at the bottom. Within the tank is a horizontal shaft with suitably inclined propeller blades, above which are baffle plates which aid in keeping the streams of stock flowing in the desired directions.—A.P.-C.

Sampling and Analysis of Coal*

Tentative Official Standard Method of the Technical Association of the Pulp and Paper Industry

This method is essentially the American Society for Testing Materials Standards D 21—16 and D 271—30. It has been somewhat simplified in order to make it more concise without changing any essential details.

Sampling

The main object in taking a sample of coal is to secure a small portion of the coal which represents as nearly as possible the entire shipment. It is extremely important that the sample be properly taken, as in many cases it is entirely impossible to obtain another sample. Wherever possible the sample should be collected while the coal is being loaded into or unloaded from cars, boats, wagons, or other conveyor. When coal is being crushed as received, it is often advantageous to take the sample as it comes from the crusher. Samples taken from the surface of coal in piles or bins or in cars, ships or barges, are generally unreliable.

GROSS SAMPLE: In collecting the sample a shovel or other tool shall be used which will take equal portions. For slack or small sizes of anthracite each shovelful may be as small as 5 to 10 pounds, but for lump coal or run of mine each shovelful should be at least 10 to 30 pounds. The total sample obtained in this way is called the gross sample. Wherever possible the gross sample should not be less than 1000 pounds, except in the case of slack coal and small sizes of anthracite in which the impurities do not exist in abnormal amount or in pieces greater than ¾ inch, where 500 pounds is sufficient. If the coal contains an unusual amount of slate or other impurities and if the pieces of such impurities are very large, a gross sample of 1500 pounds or more shall be collected. The gross sample shall contain the same proportions of lump, fine and impurities as in the coal sampled and should preferably be collected in a large receptacle with cover attached.

A gross sample shall be taken for each 500 tons or less delivered, unless otherwise specified.

When necessary to sample from bins or piles the shovelfuls shall be taken by a systematic plan in sufficient number to make the proper gross sample and from as nearly all parts of the pile as possible, discarding the outer surface and securing as nearly as possible the same amount of the top, middle and bottom of the coal. In the case of a loaded car, equal increments shall be taken about 1 foot below the surface in the locations shown on the attached Fig. 1.

LABORATORY SAMPLE: Having secured the gross sample (protected from the weather to avoid loss or gain in moisture), it shall be reduced down to a smaller sample as follows:

Break down large lumps of coal and impurities on a clean, hard, dry, floor with a suitable maul or sledge until, as judged by the eye, there are no pieces larger than specified. (See Table I). Then thoroughly mix by shovelling over and over and form in a conical pile. Reduce this down by the alternate shovel method as follows: Take a shovelful from the conical pile and spread it out in a straight line having a width equal to the width of the shovel and a length from 5 to 10 feet. Then spread the next shovelful in the opposite direction over the top of the first. Continue this, occasionally flattening the pile, until all the coal has been formed into one long narrow pile. Starting at one end, on the side, take one shovelful from the bottom and set it aside. Then advance along the side of the pile a distance equal to the width of the shovel, take a second shovelful and set it aside in a second pile. Again advance in the same direction one shovel width, take a third shovelful and add to the first. Take the fourth shovelful in the same manner and add it to the second. Proceed in this way putting even shovelfuls in one pile and odd in another. Continue to advance in the same direction around the original pile so that its size will be gradually reduced in a uniform manner. Finally there will be two piles containing approximately the same amount of coal. Discard one of these. Spread out the other and crush down to the size indicated in the table. Then form in a conical pile, followed by a long narrow pile, and again reduce by the alternate shovel method.

TABLE I
REQUIRED FINENESS FOR GIVEN WEIGHT OF SAMPLE

Weight of Sample	Largest Size Allowable
1,000 pounds or over	1 inch
500 pounds	¾ inch
250 pounds	½ inch
125 pounds	⅜ inch
60 pounds	¼ inch
30 pounds or less	⅛ inch (4-mesh)

After the gross sample has been reduced by the above method to approximately 250 pounds, it shall be further reduced in quantity by the quartering method. Before each quartering it shall be crushed to the fineness prescribed in Table I. For quartering, form into a conical pile and flatten out the cone into a pile of uniform thickness. Divide with a shovel or board into 4 equal segments and discard 2 opposite quarters. Mix the two remaining quarters, crush down to the proper size, mix, reform a conical pile and quarter as before. Continue the process until the coal has been reduced to ⅛-inch size or to pass a No. 4 sieve. The final sample should amount to about 1 to 2 quarts and shall include all of one of the final quarters or all of two opposite quarters.

The sample shall be worked down as rapidly as possible to avoid loss of moisture and immediately placed in an air-tight can or container. The outside of the container shall be plainly marked and a corresponding description placed inside.

SPECIAL SAMPLE FOR TOTAL MOISTURE: When an accurate determination of total moisture is required a special sample must be taken. This should weigh about 100 pounds and is to be obtained by placing in a waterproof container with a tight-fitting lid small equal parts of freshly taken increments of the standard gross sample. The entire moisture sample then shall be rapidly crushed and reduced mechanically or by hand to about a 5-pound quantity which shall be immediately placed in a container, sealed air-tight and forwarded to the laboratory without delay.

Preparation of Laboratory Sample

APPARATUS: The apparatus used for sampling coal shall consist of the following:

(a) *Air-Drying Oven.*—An oven for air-drying wet samples. Such an oven is not essential but is economical where many samples are to be dried.[1]

(b) *Pans for Air-Drying Wet Samples.*—Galvanized iron pans 18 by 18 in. by 1.5 inches in depth.

(c) *Balance or Solution Scale.*—A balance or scale having a capacity of 5 kg. sensitive to 0.5 g. for weighing the galvanized iron pans with samples.

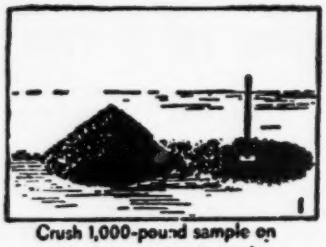
(d) *Crusher.*—A jaw crusher suitable for crushing coarse samples to pass a No. 4 sieve.

(e) *Grinder.*—A roll crusher or coffee-mill type of grinder suitable for reducing the material passing a No. 4 sieve to pass a No. 20 sieve. To reduce the moisture loss while crushing, a coffee-mill type of grinder should be entirely enclosed and have

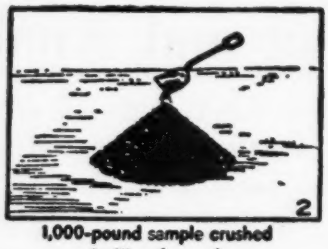
* This method has been approved by the Non-Fibrous Materials Testing Committee of the Technical Association of the Pulp and Paper Industry. Send criticisms and suggestions to R. C. Griffin, chairman, 30 Charles River Road, Cambridge, Mass.

[1] For details of air-drying oven, see F. M. Stanton and A. C. Fieldner, "Methods of Analyzing Coal and Coke," Technical Paper No. 8, Bureau of Mines, p. 2 (1926).

First stage in the preparation of 1,000-pound sample



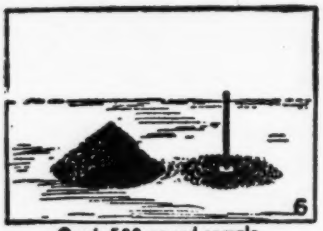
Crush 1,000-pound sample on hard, clean surface to 1" size



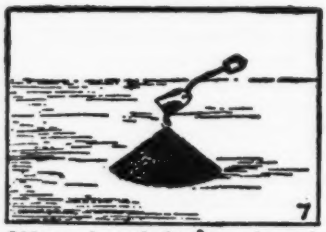
1,000-pound sample crushed to 1" and coned

Mix by forming long pile.
A—spreading out first shovelful.
B—long pile completed

Second stage.



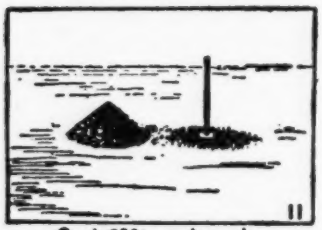
Crush 500-pound sample (fig. 5, *A*) to ¾" size



500 pounds crushed to ¾" and coned

Mix by forming long pile.
A—spreading out first shovelful.
B—long pile completed

Third stage.

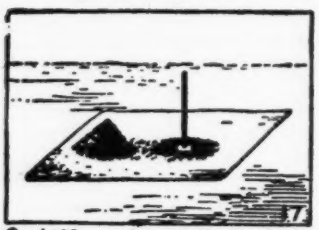


Crush 250-pound sample (fig. 10, *A*) to ½" size

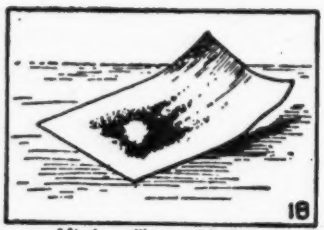
250-pounds crushed to ½" and coned

Mix by forming new cone

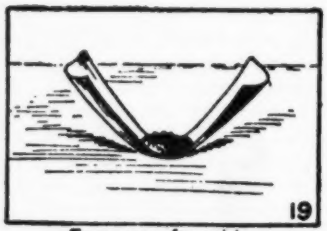
Fourth stage.



Crush 125-pound sample (fig. 16: *A*, *A*) on blanket to ⅜" size

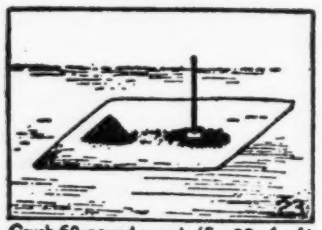


Mix by rolling on blanket

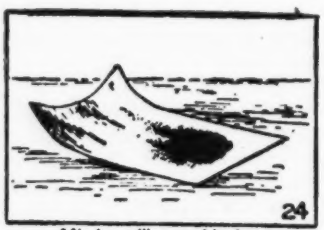


Form cone after mixing

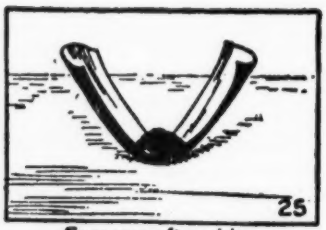
Fifth stage



Crush 60-pound sample (fig. 22: *A*, *A*) to ¼" size

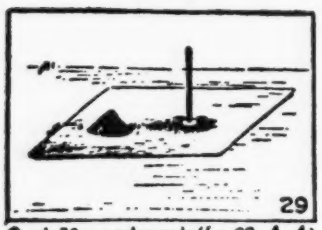


Mix by rolling on blanket

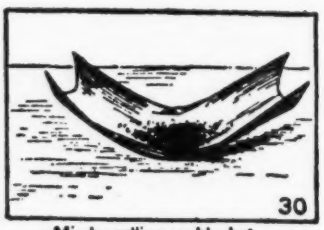


Form cone after mixing

Sixth stage.



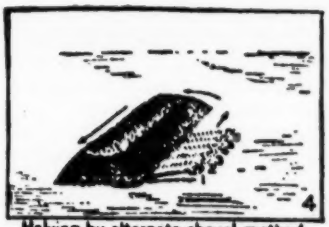
Crush 30-pound sample (fig. 28. *A*, *A*) to ⅜" or 4-mesh size



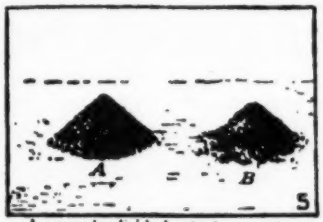
Mix by rolling on blanket

Form cone after mixing

FIG. 1



Halving by alternate shovel method. Shovelfuls 1, 3, 5, etc., reserved as 5, *A*; 2, 4, 6, etc., rejected as 5, *B*

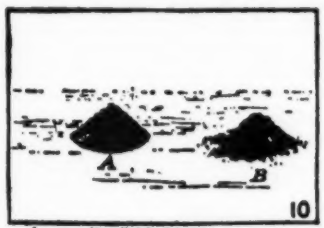


Long pile divided into two parts; *A*—reserve; *B*—reject

NOTE

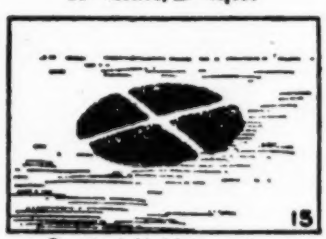
SELECT A HARD, CLEAN SURFACE, FREE OF CRACKS AND PROTECTED FROM RAIN, SNOW, WIND, AND BEATING SUN. DO NOT LET CINDERS, SAND, CHIPPINGS FROM FLOOR, OR ANY OTHER FOREIGN MATTER GET INTO THE SAMPLE. PROTECT SAMPLE FROM LOSS OR GAIN IN MOISTURE

Halving by alternate shovel method. Shovelfuls 1, 3, 5, etc., reserved as 10, *A*; 2, 4, 6, etc., rejected as 10, *B*



Long pile divided into two parts; *A*—reserve; *B*—reject

Quarter after flattening cone

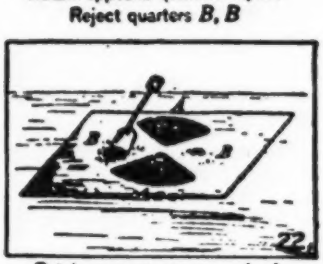


Sample divided into quarters

Retain opposite quarters *A*, *A*. Reject quarters *B*, *B*

Quarter after flattening cone

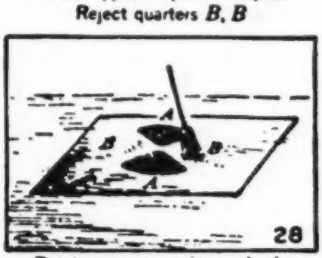
Sample divided into quarters



Retain opposite quarters *A*, *A*. Reject quarters *B*, *B*

Quarter after flattening cone

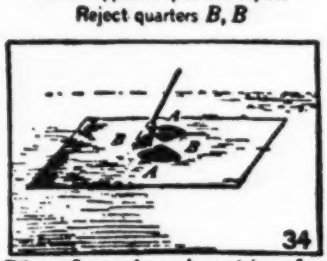
Sample divided into quarters



Retain opposite quarters *A*, *A*. Reject quarters *B*, *B*

Quarter after flattening cone

Sample divided into quarters



Fill two 5-pound sample containers from *A*, *A*, one for laboratory, one for reserve

FIG. 1

an enclosed hopper and receptacle capable of holding 10 pounds of coal.

(f) *Pulverizer.*—An Abbé ball mill, planetary disk crusher, chrome-steel bucking board, or a satisfactory form of pulverizer for reducing the material passing a No. 20 sieve to pass a No. 60 sieve. The porcelain jars for the ball mill should be approximately 9 inches in diameter and 10 inches high. The flint pebbles should be smooth, hard and well rounded.

(g) *Large Riffle Sampler.*—A large riffle sampler with ½ or ⅝ inch divisions for reducing the coal passing the No. 4 sieve to 10 pounds.

(h) *Small Riffle Sampler.*—A small riffle sampler with ¼ or ⅛ inch divisions for reducing the material passing the No. 20 and the No. 60 sieves to a laboratory sample.

(i) *Sieve.*—An 8-inch No. 60 sieve with cover and receiver.

Note: The sieve designations employed are those of the Standard Specifications for Sieves for Testing Purposes (A.S.T.M. Designation: E 11) of the American Society for Testing Materials, and all sieves shall conform to the detailed requirements of these specifications.

(j) *Containers.*—Samples in which the moisture content is important should always be shipped in moisture-tight containers. A galvanized-iron or tin can with an air-tight friction top or a screw top which is sealed with a rubber gasket and adhesive tape is best adapted to this purpose. Glass fruit jars sealed with rubber gaskets may be used, but require very careful packing to avoid breakage in transit. Samples in which the moisture content is of no importance need no special protection from loss of moisture.

Method of Laboratory Sampling

(A) For Coal Appearing Dry:

(a) If the sample is coarser than will pass completely a No. 4 sieve and larger in amount than 10 pounds, quickly crush it with the jaw crusher to pass a No. 4 sieve and reduce it on the larger riffle sampler to 10 pounds[2]; then crush it at once to pass a No. 20 sieve by passing through rolls or an enclosed grinder, and take, without sieving, a 50-g. total moisture sample, immediately after the material has passed through the crushing apparatus. This sample should be taken with a spoon from various parts of the product passing a No. 20 sieve, and should be placed directly in a rubber-stoppered bottle.

(b) Thoroughly mix the main portion of the sample, reduce on the small riffle sampler to about 200 g., and pulverize to pass a No. 60 sieve by any suitable apparatus without regard to loss of moisture. After all the material has been passed through the No. 60 sieve, mix and divide it on the small riffle sampler to about 50 g. Transfer the final sample to a 4-ounce rubber-stoppered bottle. Determine moisture in both the No. 60 sieve sample and the No. 20 sieve sample as described later.

(c) *Calculation.*—Calculate the analysis of the coal passing the No. 60 sieve, which has become partly air-dried during sampling, to the dry-coal basis, by dividing each result by 1 minus its content of moisture, expressed as a decimal. Compute the analysis of the coal "as received" from the dry-coal analysis by multiplying by 1 minus the total moisture found in the sample passing a No. 20 sieve.

(B) For Coal Appearing Wet:

(a) Spread the sample on tared pans, weigh, and air-dry at room temperature, or in the special drying oven at 10 to 15 deg. C. above room temperature, and weigh again. The drying should be continued until the loss in weight is not more than 0.1 per cent per hour. Complete the sampling as described above under dry coal.

(b) *Calculation.*—Correct the moisture found in the air-dried sample passing a No. 20 sieve to total moisture "as received," as follows:

$$\frac{100 - \text{Percentage of air-drying loss}}{100} \times (\text{percentage of moisture in air-dried sample passing a No. 20 sieve}) + (\text{percentage of air-drying loss}) = (\text{total moisture "as received"}).$$

(c) Calculate the analysis to "dry-coal" and "as received" basis as described above under dry coal, using for the "as received" calculation the total moisture as found by the formula in paragraph (b) in place of the moisture found in the coal passing a No. 20 sieve.

Notes: Freshly mined or wet coal loses moisture rapidly on exposure to the air of the laboratory, hence the sampling operations between opening the container and taking the total-moisture sample passing a No. 20 sieve must be conducted with the utmost dispatch and with minimum exposure to air.

The accuracy of the method of preparing laboratory samples should be checked frequetly by resampling the rejected portions and preparing a duplicate sample. The ash in the two samples should not differ by more than the following limits:

	Per cent
No carbonates present	0.4
Considerable carbonate and pyrite present	0.7
Coals with more than 12% ash, containing considerable carbonate and pyrite	1.0

PROXIMATE ANALYSIS

(1) Moisture

Apparatus:

(a) *Moisture Oven*—For determining the moisture of coal, the oven shall be so constructed as to have a uniform temperature in all parts and a minimum of space.[3] Provision shall be made for renewing the air in the oven at the rate of two to four times a minute, with the air dried by passing it through concentrated H_2SO_4.

(b) *Capsules with Covers*—A convenient form, which allows the ash determination to be made on the same sample, is a porcelain capsule, ⅞ inch deep and 1¾ inches in diameter; or a fused silica capsule of similar shape. This shall be used with a well-fitting flat aluminum cover. Platinum crucibles or glass capsules with ground glass caps may also be used. They should be as shallow as possible, consistent with convenient handling.

Determination:

(A) *For Coal Passing No. 60 Sieve:*

(a) Heat the empty capsules under the conditions at which the sample is to be dried, place stopper or cover on capsule, cool in a desiccator over concentrated H_2SO_4 for 30 minutes, and weigh. Dip out with a spoon or spatula from the sample bottle approximately 1 g. of the sample; put this quickly into the capsule, close and weigh at once.

After removing the covers, quickly place the capsules in a preheated oven (at 104 to 110 deg. C.) through which passes a current of air dried by concentrated H_2SO_4. Close the oven at once and heat for 1 hour. Then open the oven, cover the capsules quickly and place them in a desiccator over concentrated H_2SO_4. When cool, weigh.

The percentage of moisture in the sample passing a No. 60 sieve shall be used to calculate the other results to a dry basis.

(B) *For Coal Passing No. 20 Sieve:*

Use 5-g. samples, weighed with an accuracy of 2 mg., and heat for 1½ hours; the procedure is otherwise the same as with the sample passing a No. 60 sieve as described above.

(2) Ash

Apparatus:

(a) *Gas or Electric Muffle Furnace*—For determination of ash the muffle shall have good air circulation and be capable of having its temperature regulated between 700 and 750 deg. C.

[2] If the sample is crushed to pass a No. 6 sieve it may be reduced to 5 pounds.

[3] A convenient form is shown in Tech. Paper No. 8, Bureau of Mines, p. 8 (1926).

(b) *Porcelain Capsules*—Porcelain capsules, ⅞ in. deep and 1¼ in. in diameter, or similar shallow dishes or platinum crucibles.

DETERMINATION: Place the capsules containing the dried coal from the moisture determination in a cold muffle furnace, or on the hearth at a low temperature, and gradually heat to redness at such a rate as to avoid mechanical loss from too rapid expulsion of volatile matter. Finish the ignition to constant weight (± 0.001 g.) at a temperature between 700 and 750 deg. C. Cool in a desiccator and weigh as soon as cold.

Note: Before replacing the capsules in the muffle for ignition to constant weight, the ash should be stirred with a platinum or nichrome wire. Stirring once or twice before the first weighing hastens complete ignition.

(3) Volatile Matter

APPARATUS:

(a) *Platinum Crucible with Closely Fitting Cover*—The crucible shall be of not less than 10 nor more than 20-cc. capacity; of not less than 25 nor more than 35 mm. in diameter; of not less than 30 nor more than 35 mm. in height.

(b) *Vertical Electric Tube Furnace; or a Gas or Electrically Heated Muffle Furnace*—The furnace shall be regulated to maintain a temperature of 950 ± 20 deg. C. in the crucible, as shown by a thermocouple kept in the furnace. If the determination of volatile matter is not an essential feature of the specifications under which the coal is bought, a Meker burner may be used.

DETERMINATION:

(a) *Usual Method*—Weigh 1 g. of the sample in a weighed platinum crucible, close with a cover, and place on platinum or nichrome-wire supports in the furnace chamber, which shall be at a temperature of 950 ± 20 deg. C. After the more rapid discharge of volatile matter has subsided, as shown by the disappearance of the luminous flame, tap the cover lightly to more perfectly seal the crucible and thus guard against the admission of air. After heating for exactly 7 minutes, remove the crucible from the furnace and, without disturbing the cover, allow it to cool. Weigh as soon as cold. The loss of weight minus moisture equals the volatile matter.

(b) *Modification for Sub-Bituminous Coal*—Mechanical losses are incurred on suddenly heating sub-bituminous coal; therefore it must be subjected to a preliminary gradual heating for 5 minutes. This is best done by playing the flame of a burner upon the bottom of the crucible in such a manner as to bring about the discharge of volatile matter at a rate not sufficient to cause sparking. After the preliminary heating, transfer the crucible to the volatile-matter furnace and heat for 6 minutes at 950 deg. C. as in the regular method described above.

Notes: The cover should fit closely enough so that the carbon deposit from bituminous and lignite coals does not burn away from the under side.

Regulation of temperature to within the prescribed limits is important.

(c) *Meker Burner Method*—Weigh 1 g. of the sample in a weighed platium crucible anad close with a cover. Place in the flame of a No. 4 Meker burner, having approximately an outside diameter at the top of 25 mm. and giving a flame not less than 15 cm. high. The temperature should be 950 ± 20 deg. C., as determined by placing a thermocouple through the perforated cover, which for this purpose may be of nickel or asbestos. The junction of the couple should be placed in contact with the center of the bottom of the crucible; or the temperature may be indicated by the fusion of pure K_2CrO_4 in the covered crucible (fusion temperature of K_2CrO_4, 968 deg. C.)[4] The crucible shall be placed in the flame about 1 cm. above the top of the burner and the heating continued 7 minutes. Where the gas pressure is variable it is well to use a U-tube attachment to the burner.

[4] U. S. Bureau of Mines, Reports of Investigations, Serial No. 2917 (1929).

(4) Fixed Carbon

Calculate fixed carbon as follows:

100 — (moisture + ash + volatile matter) = percentage of fixed carbon.

(5) Sulphur (Eschka Method)

APPARATUS:

(a) *Gas or Electric Muffle Furnace, or Burners*—For igniting the sample with the Eschka mixture and for igniting the $BaSO_4$.

(b) *Porcelain or Platinum Crucibles or Capsules*—Porcelain capsules, ⅞ in. deep and 1¾ in. in diameter, or porcelain crucibles of 30-cc. capacity, high or low form, or platinum crucibles of similar size shall be used for igniting the sample with the Eschka mixture.

(c) Porcelain, platinum, alundum or silica crucibles of 10 to 15 cc. capacity, shall be used for igniting the $BaSO_4$.

SOLUTIONS AND REAGENTS:

(a) *Barium Chloride*—Dissolve 100 g. of $BaCl_2.2H_2O$ in 1000 cc. of distilled water.

(b) *Saturated Bromine Water*—Add an excess of bromine to 1000 cc. of distilled water.

(c) *Eschka Mixture*—Thoroughly mix 2 parts (by weight) of light calcined MgO and 1 part of anhydrous Na_2CO_3. Both materials should be as free as possible from sulphur.

(d) *Methyl Orange*—Dissolve 0.02 g. in 100 cc. of hot distilled water and filter.

(e) *Hydrochloric Acid*—Mix equal volumes of concentrated HCl (sp. gr. 1.19) and distilled water.

(f) *Normal Hydrochloric Acid*—Dilute 80 cc. of concentrated HCl to 1 liter with distilled water.

(g) *Sodium Carbonate*—A saturated solution, approximately 60 g. of crystallized or 22 g. of anhydrous Na_2CO_3 in 100 cc. of distilled water.

(h) *Sodium Hydroxide Solution*—Dissolve 100 g. in 1 liter of distilled water. This solution may be used in place of the Na_2CO_3 solution.

DETERMINATION: Thoroughly mix on glazed paper 1 g. of the sample and 3 g. of Eschka mixture. Transfer to a porcelain capsule, ⅞ inch deep and 1¾ inches in diameter, or a porcelain crucible of 30-cc capacity, high or low form, or platinum crucible of similar size, and cover with about 1 g. of Eschka mixture.

On account of the amount of sulphur contained in artificial gas, the crucible shall be heated over an alcohol, gasoline or natural gas flame, or in a gas or electrically heated muffle as described below. The use of artificial gas for heating the sample and Eschka mixture is permissible only when the crucibles are heated in a muffle.

Heat the crucible, placed in a slanting position on a triangle, over a very low flame to avoid rapid expulsion of the volatile matter, which tends to prevent complete absorption of the products of combustion of the sulphur. Heat the crucible slowly for 30 minutes, gradually increasing the temperature and stirring after all black particles have disappeared, which is an indication of the completeness of the procedure. Place the crucible in a cold muffle and gradually raise the temperature to 800 ± 25 deg. C. in about 1 hour. Maintain this maximum temperature for about 1½ hours. Remove and empty the contents into a 200-cc. beaker and digest with 100 cc. of hot water for ½ to ¾ hour, with occasional stirring. Filter and wash the insoluble matter by decantation. After several washings in this manner, transfer the insoluble matter to the filter and wash five times, keeping the mixture well agitated. Treat the filtrate, amounting to about 250 cc., with 10 to 20 cc. of saturated bromine water, make slightly acid with HCl and boil to expel the liberated bromine. Make just neutral to methyl orange with NaOH or Na_2CO_3 solution, then add 1 cc. of *N* HCl. Boil again and add slowly from a pipette, with constant stirring, 10 cc of a 10 per cent solution of $BaCl_2$. ($BaCl_2.2H_2O$.) $2H_2O$. Continue boiling for 15 minutes and let stand for at least

2 hours or preferably over night, at a temperature just below boiling. Filter through an ashless filter paper and wash with hot distilled water until $AgNO_3$ solution shows no precipitate with a drop of the filtrate. Place the wet filter containing the precipitate of $BaSO_4$ in a weighed platinum, porcelain, silica or alundum crucible, allowing a free access of air by folding the paper over the precipitate loosely to prevent spattering. Smoke the paper off gradually and at no time allow it to burn with flame. After the paper is practically consumed, raise the temperature to approximately 925 deg. C. and heat to constant weight.

The residue of MgO, etc. after leaching, should be dissolved in HCl and tested with great care for sulphur. When an appreciable amount is found this should be determined quantitatively. The amount of sulphur retained is by no means a negligible quantity.

In all cases a correction must be applied either (1) by running a blank exactly as described above, using the same amount of all reagents that were employed in the regular determination, or more surely (2) by determining a known amount of sulphate added to a solution of the reagents after these have been put through the prescribed series of operations. If this latter procedure is adopted and carried out, say, once a week or whenever a new supply of a reagent must be used, and for a series of solutions covering the range of sulphur content likely to be met with in the samples, it is only necessary to add to or subtract from the weight of $BaSO_4$ obtained from a sample, whatever deficiency or excess may have been found in the appropriate "check" in order to obtain a result that is more certain to be correct than if a "blank" correction as determined by the former procedure is applied. This is due to the fact that the solubility error for $BaSO_4$, for the amounts of sulphur in question and the conditions of precipitation prescribed, is probably the largest one to be considered. $BaSO_4$ is soluble in acids and even in pure water, and the solubility limit is reached almost immediately on contact with the solvent. Hence, in the event of using reagents of very superior quality or of exercising more than ordinary precautions, there may be no apparent "blank" because the solubility limit of the solution for $BaSO_4$ has not been reached or at any rate not exceeded.

Calculate the sulphur content as follows:

$$\text{Percentage of Sulphur} = \frac{(\text{weight of } BaSO_4 - \text{blank}) \times 13.74}{\text{weight of sample}}$$

CALORIMETRIC DETERMINATION (B.t.u.)

APPARATUS:

(a) *Combustion Bombs*—The Atwater, Davis, Emerson, Mahler, Parr, Peters, Williams, or similar bombs may be used. The bomb shall have an inner surface and accessory fittings, including crucible, of platinum, gold, porcelain enamel, or other material which is not attacked by HNO_3 and H_2SO_4, or other products of combustion.

(b) *Calorimeter Jacket*—The calorimeter shall be provided with a water-jacket having a cover to protect the calorimeter from air currents. The jacket shall be kept filled with water within 2 or 3 deg. C. of the temperature of the room (except in calorimeters which are totally submerged, where the jacket temperature is controlled by a thermostat) and should be stirred continuously by some mechanical stirring device.

(c) *Stirring of the Calorimeter Water*—The water in the calorimeter shall be stirred sufficiently well to give consistent thermometer readings while the temperature is rising rapidly. The speed of stirring should be kept constant. A motor-driven screw or turbine stirrer is recommended and the speed should not be excessive. This may be determined by adjusting the temperature of the calorimeter to equality with that of the jacket and allowing the stirrer to run continuously for 10 minutes. If the temperature of the calorimeter rises more than about 0.01 deg. C. in this length of time, the rate of stirring is excessive. Accurate results cannot be obtained when too much energy is supplied by the stirring device or when the rate of stirring is irregular. The portion of the stirring device immersed in the calorimeter should be separated from that outside by non-conducting material, such as hard rubber, to prevent conduction of heat from the motor or outside air.

(d) *Thermometers*—Thermometers used shall have been certified by a government testing bureau and shall be used with the corrections given on the certificate. This shall also apply to electrical resistance or thermo-electric thermometers. Correction shall also be made for the temperature of the emergent steam of all mercurial thermometers, and for the "setting" of Beckmann thermometers. For accurate work, either Beckmann or special calorimetric thermometers graduated to 0.01 or 0.02 deg. C. are required. Such thermometers should be tapped lightly just before each reading to avoid errors caused by the sticking of the mercury meniscus, particularly when the temperature is falling. A convenient method is to mount a small electric buzzer directly on the top of the thermometer and connect it with a dry cell and a push button. The button should be pressed for a few seconds immediately before each reading.

(e) *Oxygen*—The oxygen used for combustions shall be free from combustible material. The bomb when filled should contain at least 5 per cent of nitrogen to insure complete oxidation of the sulphur. The total amount of oxygen contained in the bomb for combustion shall not be less than 5 g. per gram of the sample. But the combustion must be complete, as shown by the absence of any sooty deposit on opening the bomb after firing.

(f) *Firing Wire*—The sample in the bomb may be ignited by means of either iron or platinum wire. If iron wire is used, it should be of about No. 34 B. & S. gage (diameter about 0.006 inch) and not more than 10 cm. (preferably 5 cm.) should be used at a time. A correction of 1600 calories per gram weight of iron wire burned shall be subtracted from the observed number of calories.

STANDARD ALKALI SOLUTION: Dissolve 18.28 g. of pure anhydrous Na_2CO_3 in distilled water and dilute to 1 liter. 1 cc. is equivalent to 0.02173 gram of HNO_3, the heat of formation of which is 5 calories or 9 B.t.u.

STANDARDIZATION: The water equivalent of a calorimeter can best be determined by the use of the standard combustion samples supplied by the U. S. Bureau of Standards. The required water equivalent is equal to the weight of the sample multiplied by its heat of combustion per gram and divided by the corrected rise in temperature.

The calorimeter shall be standardized by the combustion of standard samples supplied by the Bureau of Standards, and used according to the directions given in the certificates which accompany them. A standardization shall consist of a series of not less than five combustions of either the same or different standard materials. The conditions as to the amount of water, oxygen, firing wire, method of correcting for radiation, etc., under which these combustions are made shall be the same as for combustions of the sample. In the case of any disagreement between contracting parties a check standardization may consist of two or more combustions of standardizing samples.

DETERMINATION: The ground sample (passing No. 60 sieve) shall be thoroughly mixed in the bottle and an amount, approximately 1 g., shall be taken out and weighed in the crucible in which it is to be burned. Samples which are likely to be blown out of the crucible should be briquetted. After weighing, the sample should preferably be immediately placed in the bomb and this closed. This procedure is necessary to avoid sublimation in the use of naphthalene for standardization.

The firing wire, if iron, shall be measured and coiled in a small spiral and connected between the platinum terminals, using, if necessary, a piece of platinum wire somewhat heavier than the iron wire, to make the connection. The platinum and the iron shall both be clean. About 0.5 cc. of water should be placed in the bottom of the bomb to saturate with moisture the oxygen used for combustion. When the crucible is put in place in the bomb, the firing wire should touch the sample or briquet of standard

material. For the combustion of standardizing samples iron wire is preferable to platinum.

Oxygen from the supply tank shall be admitted slowly to avoid blowing the sample from the crucible, and the pressure allowed to reach 20 atmospheres for the larger bombs or about 30 atmospheres for the smaller bombs, so that the bomb shall contain an amount of oxygen sufficient for complete combustion, namely, at least 5 g. per gram of the sample. This method of filling should insure 4 per cent of nitrogen in the larger bombs, irrespective of the nitrogen contained in the oxygen.

The calorimeter shall be filled with the required amount of distilled water, depending upon the type of calorimeter. The amount may be determined either by measurement in a standardized flask or by weighing. The amount shall be kept the same as that used in the standardization of the apparatus.

The initial temperature in the calorimeter shall be so adjusted that the final temperature, after the combustion, will not be more than 1 deg. C., preferably about 0.5 deg. C., above that of the jacket, under which conditions the total correction for heat gained from or lost to the surroundings will be small when the rise of temperature is 2 or 3 deg. C., and the effect of evaporation will also be small.

The electric current used for firing the charge shall be obtained from storage or dry cells having an electromotive force of not more than 12 volts. A higher voltage is liable to cause an arc between the firing terminals, introducing additional heat, which cannot be measured with certainty. The circuit should be closed by means of a switch which should remain closed for not more than 2 seconds. When possible, it is recommended that an ammeter be used in the firing circuit to indicate when the firing wire has burned out.

The bomb when ready for firing shall be placed in the calorimeter, the firing wires connected, the cover put in place and the stirrer and thermometer so placed as not to be in contact with the bomb or container. The stirrer shall then be started and after the thermometer reading has become steady, not less than 2 minutes after the stirrer is started, temperatures shall be read at 1-minute intervals for 5 minutes and the charge then fired, the exact time of firing being noted. Observations of temperature shall then be made at intervals depending upon the method to be used for computing the cooling correction. When the temperature has reached its maximum and is falling uniformly, a series of thermometer readings shall be taken at 1-minute intervals for 5 minutes to determine the final cooling rate.

After a combustion and after allowing the gas to escape, the bomb shall be opened and the inside examined for traces of unburned material or sooty deposit. If these are found, the observations shall be discarded. If combustion appears complete, the bomb shall be rinsed out thoroughly and the washings titrated with the standard alkali solution (1 cc. = 0.02173 g. HNO_3 = 5 calories), using methyl-orange or methyl-red indicator, to determine the amount of acid formed. A correction of 230 calories per gram of HNO_3 should be subtracted from the total heat observed. An additional correction of 1300 calories per gram of sulphur in the sample should be made for the excess of difference in heats of formation of SO_2 and aqueous H_2SO_4 over the heat of formation of aqueous HNO_3.

CALCULATIONS OF RESULTS:

The following method of calculation is recommended to take the place of the Pfaundler or other similar formulas for calculating the cooling correction (radiation correction):

Observe (1) the rate of rise, r_1, of the calorimeter temperature in degrees per minute for 5 minutes before firing; (2) the time, *a*, at which the last temperature reading is made immediately before firing; (3) the time, *b*, when the rise of temperature has reached six-tenths of its total amount (this point can generally be determined by adding to the temperature observed before firing, 60 per cent of the expected[5] temperature rise, and noting the time at which this point is reached); (4) the time, *c*, of a thermometer reading taken when the temperature change has become uniform some 5 minutes after firing; (5) the final rate of cooling, r_2, in degrees per minute for 5 minutes.

Multiply the rate r_1 by the time $b - a$ in minutes and tenths of a minute, and add to this product (subtract if the temperature was falling at the time *a*) to the thermometer reading taken at the time *a*. Multiply the rate r_2 by the time $c - b$ and add this product (subtract if the temperature was rising at the time *c* and later) to the thermometer reading taken at the time *c*. The difference of the two thermometer readings thus corrected, provided the corrections from the thermometer certificate have already been applied, gives the total rise of temperature due to the combustion. This multiplied by the water equivalent of the calorimeter gives the total amount of heat liberated. Divide this result, corrected for the heats of formation of HNO_3 and H_2SO_4 observed and for the heat of combustion of the firing wire, when that is included, by the weight of the charge to find the heat of combustion in calories per gram. Calories per gram multiplied by 1.8 give the British thermal units per pound. (See example.)

Note: In practice, the time $b - a$ will be found so nearly constant for a given calorimeter with the usual amounts of fuel that *b* need be determined only occasionally.

The results shall be reduced to calories per gram or British thermal units per pound of ***dry sample***, the moisture being determined upon a sample taken from the bottle at about the same time as the combustion sample is taken.

EXAMPLE

OBSERVATIONS

Water equivalent = 2550 g.
Weight of charge = 1.0535 g.
Approximate rise of temperature expected = 3.2 deg. C.
60 per cent of approximate rise = 1.9 deg. C.

Time	Thermometer Readings deg. C.	Corrected Temperature (or corrected Beckmann thermometer readings)
10:21	15.244	Thermometer corrections taken from the certificate
22	15.250	
23	15.255	
24	15.261	
25	15.266	
(*a*)26	15.272	15.276 deg. C.
		Charge fired
(*b*)27.2	17.2 [6]	
(*c*)31	18.500	18.497 deg. C.
32	18.498	
33	18.497	
34	18.498	
35	18.494	
36	18.493	

CALCULATION

r_1 = 0.028 degrees ÷ 5 = 0.0056 degrees per minute. $b - a$ = 1.2 minutes.
The corrected initial temperature is
15.276 degrees + 0.0056 degrees × 1.2 ..... = 15.283 degrees
r_2 = 0.007 degrees ÷ 5 = 0.0014 degrees per minute. $c - b$ = 3.8 minutes.
The corrected final temperature is
18.497 degrees + 0.0014 degrees × 3.8 ..... = 18.502
Total rise, 18.502 — 15.283 ..... = 3.219
Total calories, 2550 × 3.219 ..... = 8209
Titration, etc. ..... = —7
Calories from 1.0535 g. sample 8202
Calories per gram 7785
or British thermal units per pound 14013

[6] The initial temperature is 15.27 deg. C.; 60 per cent of the expected rise is 1.9 deg. C. The reading to observe is then 17.2 deg. C.

The results obtained by the above method of computation and determination is the total heat of combustion at constant volume, with the water in the products of combustion condensed to liquid at the temperature of the calorimeter, that is, about 20 to 35 deg. C.

Notes: For anthracite, coke and coal of high ash content, which do not readily burn completely, the following procedure is recommended.

The inside of the crucible is lined completely with ignited asbestos in a thin layer pressed well down into the angles. The

[5] When the temperature rise is not approximately known beforehand, it is only necessary to take thermometer readings at 40, 50, 60 seconds (and possibly 70 seconds with some calorimeters) after firing, and from these observations to find when the temperature rise had reached 60 per cent of the total. Thus, if the temperature at firing was 2.135 deg. C., at 40 seconds 3.05 degrees, at 50 seconds 3.92 degrees, at 60 seconds 4.16 degrees, and the final temperature was 4.200 degrees, the total rise was 2.07 degrees; 60 per cent of it was 1.24 degrees. The temperature to be observed was then 2.14 degrees + 1.24 degrees = 3.38 degrees. Referring to the observations at 40 and 50 seconds, the temperatures were respectively 3.05 and 3.92 degrees. The time corresponding to the temperature of 3.38 degrees was, therefore:

$$40 + \frac{3.38 - 3.05}{3.92 - 3.05} \times 10 = 44 \text{ seconds.}$$

sample is then sprinkled evenly over the surface of the asbestos. Otherwise the procedure is as previously described.

The method of computing the "cooling correction" described in U. S. Bureau of Mines, Technical Paper No. 8, pp. 24-28 (1926), may be also used.

TOLERANCES

The permissible differences between two or more determinations shall not exceed the values as specified.

	Permissible Differences	
	Same Laboratory	Different Laboratories
A. On Laboratory Samples, Crushed to Pass No. 20 Sieve		
Moisture:		
Under 5 per cent	0.2	0.3
Over 5 per cent	0.3	0.5
B. On Laboratory Samples, Crushed to Pass No. 60 Sieve		
1. *Moisture:*		
Under 5 per cent	0.2	0.3
Over 5 per cent	0.3	0.5
2. *Ash:*		
No carbonates present	0.2	0.3
Carbonates present	0.3	0.5
Coals with more than 12 per cent ash containing carbonate and pyrite	0.5	1.0
3. *Volatile Matter:*		
Bituminous coals	0.5	1.0
Lignites	1.0	2.0
4. *Sulphur:*		
Under 2 per cent	0.05	0.10
Over 2 per cent	0.10	0.20
5. *Calorimetric Determination:*		
Permissible percentage differences [1]	0.3	0.5

[1] E.g., 0.3 per cent of 14,100 B.t.u. would be 42 B.t.u. tolerance.

TAPPI Annual Meeting

The Forest Products Laboratory has announced the papers to be presented by members of its staff at the annual meeting of the Technical Association of the Pulp and Paper Industry to be held in the Pennsylvania Hotel, New York, February 15 to 18, 1932.

"The Porosity of Papers I. An Improved Emanuelli Test," is the title of a paper by R. H. Doughty, C. O. Seborg and P. K. Baird. This paper describes an easily operated Emanuelli apparatus developed by the adaption of a Mullen tester: the technic of the test and the form of reporting the results are discussed.

The porosity of a paper sheet toward air may be expressed as (1) equivalent pore diameter, as (2) rate of air flow through the sheet, or as (3) pore fraction. These all involve arbitrary assumptions as to the shape and size of the transmitting openings. They are found experimentally to vary with applied pressure in such a way that a correction for turbulent flow must be applied; this variation is important with sheets of low solid fraction, so that the pressure under which the material is to be tested or used must be taken into consideration.

The same authors will have another paper ready entitled, "The Porosity of Papers II. The Effect of Basis Weight and Solid Fraction on the Porosity of Simple Papers.

The variation in porosity (air transmission) of pulp test sheets with basis weight and solid fraction has been studied, using a modified Emanuelli apparatus.

Solid fraction of the sheets is more important than basis weight in its effect on porosity; beyond an upper limit of about 120 pounds basis weight or 0.40 solid fraction, air transmission is practically independent of basis weight. The variations of porosity with solid fraction is such for every 0.1 unit increase in solid fraction, the air transmission is decreased about 75 per cent of the previous value. Since variations in solid fraction of sheets made from a single pulp are most readily obtained by varying the wet pressing, the importance of the latter factor is evident.

R. H. Doughty, A. P. P. A.-TAPPI fellow at the Forest Products Laboratory will present the third contribution to his consideration of "The Relation of Sheet Properties and Fiber Properties in Paper—The Effect of Fiber Length on Sheet Properties: Preliminary Experiment."

Two unbeaten pulps, a spruce and a black gum sulphite, have been separated by wet screening to obtain a long fibered and a short fibered portion from each. Sheets of a considerable range in solid fraction values have been made up from each portion and from the unfractionated pulps, and their strength, solid fraction, and porosity values compared. The sheets made from various portions are found to differ but little in tensile strength at constant solid fraction; the short-fibered portion is much stronger than the other at any wet pressure, because of the greater fiber shrinkage, which yields a denser sheet. The porosity of the sheets, which decreases continuously with increasing solid fraction are increased very markedly by increasing fiber length. Two new criteria of grease-proofness are suggested.

G. H. Chidester and J. N. McGovern will discuss, "The Effect of Relatively High Sulphur Dioxide Concentration in Sulphite Pulping."

The use of higher concentrations of sulphur dioxide than those normally employed in commercial sulphite pulping practice, but under pressures within the commercial range, showed a greater retention of sulphur dioxide in the early stages of the digestion and consequently a greater pulping effect. This effect was progressively greater as the initial concentration was increased up to about 5.5 per cent excess sulphur dioxide, alone which further increases in the sulphur dioxide content produced little effect.

W. H. Monsson and G. H. Chidester will have a paper on "A Comparison of the Pulping Value of Russian and Canadian Spruce Pulpwood by the Sulphite Process."

Sulphite pulping tests on two lots of spruce from Canada and one lot from Russia indicate no significant difference in the quality of the pulp produced from each lot. Also no difference was indicated in the yield of pulp produced when calculated on the basis of the weight of the wood used. When calculated on a volume basis, however, the yield of pulp varied with the density of the wood, which was considerably lower in one of the lots of Canadian spruce than in the other two.

E. R. Schafer who is a member of the TAPPI Waste Committee is preparing a report on the "Effect of Reuse of White Water on Paper Properties."

It is also possible that three other papers will be ready at the time of the meeting, one on the grinding of slash pine and black gum, a second on the sulphite pulping of slash pine and a third on the evaluation of groundwood pulp.

C. W. Morden of Portland, Ore., will discuss "Continuous Batch Beating," featuring the new Morden stock maker.

C. W. Rivise, patent attorney of Philadelphia, will talk on the subject of "Rights of an Employer to an Invention made by an Employe."

The Education Committee which has been carrying on an extensive survey of the industry will sponsor a paper entitled, "Report of Progress of Survey in the Pulp and Paper Industry," by Frank Cushman, chief of the trade and industrial education service of the Federal Board of Vocational Education, Washington, D. C.

James d'A. Clark of the Mead Corporation, will report a simple method for calibrating the Elmendorf tearing tester.

R. V. Bingham of Seattle, Washington, will read a paper on "Improved Agitating Methods and Scientific Consistency Control."

M. M. Klosson of Buffalo will have a paper dealing with the pumping of wood pulp and paper stock.

The Heat and Power Committee is preparing a discussion on "Paper and Board Machine Drier Capacity," and Jepp C. Hardigg will have a paper on "Boiler Fly Ash, Its Cause, Result and Cure." The committee is also preparing a paper on "Power Requirements for Auxiliary Paper Mill Equipment."

E. G. Milham of the Watervliet Paper Company will present data on "Heat Requirements for Drying Coated Paper."

B. W. Rowland and Harry F. Lewis of the Institute of Paper Chemistry staff will have a paper on "The Use of Optical Instruments for Research in Pulp and Paper."

R. S. Wertheimer of the Longview Fibre Company, Longview, Washington, is preparing a paper on "Evaporation Rates on Yankee Drier.

POWER PLANT SECTION

REDUCING POWER COSTS THROUGH UNIT TREATMENT

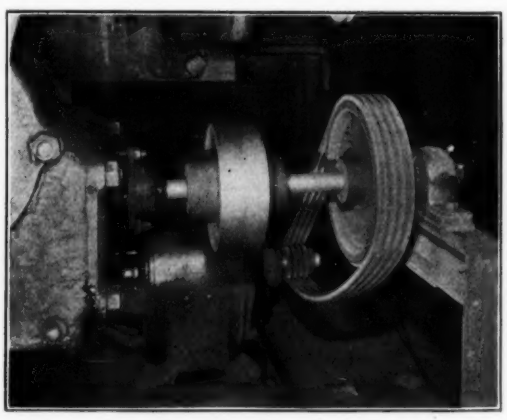
Conducted by Reginald Trautschold Consulting Engineer

Chain Drives

When and Why Preferable

Pulp mills, in particular, are very large users of chains for conveying services, many mill operators terming their conveyors "drives", but to the technical man a drive signifies simply a means for transmitting power. It is well to bear this distinction in mind when discussing chain drives, for while the present article will concern itself for the most part with the drive as a means of transmitting power, a few brief remarks concerning chains in conveying service will be of interest.

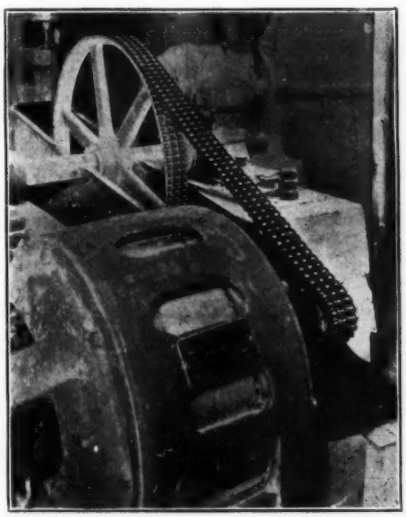
For straight conveying purposes, almost any variety of chain strong and rugged enough to withstand the heavy service can be found in use, which is very conclusive evidence that the mills have not given sufficient consideration to the selection of these important units. Standard detachable chains of medium size and larger are used extensively, numerous varieties of roller chains, combination chains with steel links and wrought iron side bars, and even heavy round and flat chains. Some mills appear to favor manganese steel chains, while others ignore the steel alloys. Generally, however, the preference seems to be for malleable iron chains with a tendency now of securing adequate strength by employing chains of the larger sizes, rather than using chains of high tensile strength steels. Only a few mills have as yet attempted much in the way of chain standardization based upon demonstrated service and cost records, though there are a few that have. For example, the plants of the Brown Company have standardized largely upon an efficient and high grade type of steel roller chain.



Courtesy: Diamond Chain & Mfg. Co.

FIG. 1

High speed quadruple roller chain drive operating actuating mechanism stoker ram.



Courtesy: Diamond Chain & Mfg. Co.

FIG. 2

High speed triple roller chain drive subjected to heavy impact and irregular loads.

The variety of chain attachments employed is even greater than the variety of chains, some very novel arrangements having been worked out in connection with apron and flight conveyor developments. The lack of agreement as to what are the best chains and varieties of attachments is so marked, in fact, that one prominent manufacturer of conveyors has been led to remark recently: "Each Superintendent or Plant Engineer is, of course, convinced that his particular method is the best". All of which goes to show that some mills are unnecessarily extravagant in the matter of chains and even more are doubtless adding unjustified burdens in upkeep expenses to their conveyors.

Power Transmission by Chains

The situation in respect to the transmission of power by chain drives is at the present time likewise one concerning which there is a good deal of disagreement. Standardiza-

tion in respect to the transmission of power by chains has been carried considerably further than chain standardization for conveying purposes, of course, for attention has naturally been focussed upon the need of efficiency in transmission, but the chain drive has to compete with modern, high efficiency, gear assemblages and of recent years with the popular and also efficient "V" belt drives. An official of a leading manufacturing establishment, a concern that has specialized for years in power transmission machinery is on record as stating, after consultation with the firm's various branch managers; "the consensus of opinion is that the chain drive is going to be more or less a thing of the past. Apparently, herringbone speed reducers and the "V" type rubber multiple drive belts have spelled the death knell of the chain drive."

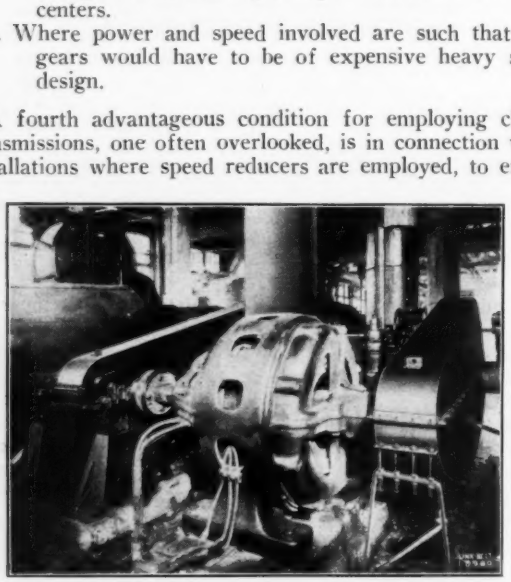
Another firm of well known engineers and manufacturers, while not actually fabricators of chain drives, rather discouraged a discussion on chain drives at this time, feeling that a discussion on "V" belt drive applications in the paper making industry would be of very live concern and of greater interest than a discussion on chain drives. Possibly this is so, but as "V" belt drives will unquestionably be featured in these columns in the near future, as they have been in the past, and also because there are many highly efficient chain drives functioning in pulp and paper mills which have given and are giving satisfaction, it would seem there are two good sides to the question and that there are still many mills interested in the subject of chain drives for the transmission of power, positively and efficiently.

When and Why Chain Drives Are Preferable

For purely power transmissions, the advocates of chain drives contend that they are preferable to gears under the following conditions:

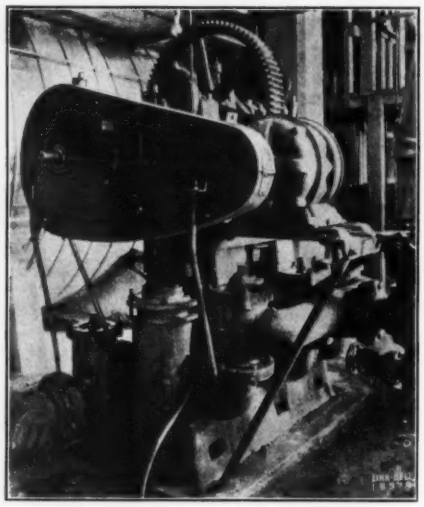
1. When the drive centers are too far apart for a pair of gears.
2. When there is a possibility of a need for changing the speed ratio of the drive, which were gears employed would necessitate the purchase of at least two gear wheels and possibly an alteration in drive centers.
3. Where power and speed involved are such that the gears would have to be of expensive heavy steel design.

A fourth advantageous condition for employing chain transmissions, one often overlooked, is in connection with installations where speed reducers are employed, to effect



Courtesy: Link-Belt Co.

FIG. 3
Toothed chain drives operating beaters at a pulp and paper mill in Oregon.



Courtesy: Link-Belt Co.

FIG. 4
Toothed chain drive applied to stock pump in the Oregon mill.

the first or last step in rotary speed change. In such cases, the chain drive not only provides a definite speed ratio, but acts as well as an efficient flexible connection to or from the speed gear.

These important advantages are not peculiar nor necessarily confined solely to chain drives, but are possessed in large measure by "V" belt drives as well. Certain varieties of chain drives do, however, possess other well defined advantages, giving to such drives a very important field in the mills of the paper making industry. Typical examples of these will be cited, but before doing so, attention may well be directed to another form of belt drive, one that despite a number of excellent and eminently satisfactory applications in paper mill services has not been accorded as much consideration as its records would seem to justify.

This latter variety of transmission chain is the multiple, high-speed roller chains consisting of several rows of independent rolls carried on pins and separated from one another by independent side bars. A triple chain of this variety carries three lines of rolls between four lines of side bars, with both rolls and side bars supported on through link-pins; a quadruple chain, four lines of rolls and five lines of side bars; and so forth.

Two typical installations of these distinctive chain drives are illustrated, the first of which shows the actuating mechanism of a stoker ram being driven by the transmission chain and the other is a view of an application entailing like heavy service and violent impact strains as well as decidedly variable and fluctuating load. The stoker drive installation, photographed with the chain in motion and the stoker in service, has much the appearance of a multiple "V" belt drive, the individual chain links moving so rapidly as to give the impression of four strands of solid belting. Actually, the driving member is a quadruple high-speed roller chain of ⅝-inch pitch, four lines of rolls between five lines of side bars, and connects a 19-tooth compounded driving sprocket on the shaft of a 15-horsepower variable speed motor (range, 1,700 to 475 revolutions per minute) with a 68-tooth compounded sprocket on the stoker shaft. At maximum speed, the driving chain travels at a speed of close to 1,700 feet per minute.

The second illustration, which clearly shows the construction of the chain, depicts a triple high-speed roller chain, three lines of rolls between four lines of side bars,

connecting a 15-horsepower constant speed motor with the driven compounded sprocket and effecting a slightly higher speed ratio than in the first case. The motor makes 1,200 revolutions per minute and the drive is effected with high mechanical efficiency.

Incidentally, both of these particular drives were installed only after attempts to utilize toothed chain drives had been unsuccessful, but this should not be interpreted as being in any way derogatory to the deservedly popular variety of chain drives that proved unequal to the demands imposed by the arduous services imposed. It is evidence, simply, that there is a chain-drive demand so severe and exacting that it can be best met, looked at from the points of view of practical efficiency and economy, only by a suitable form of roller chain.

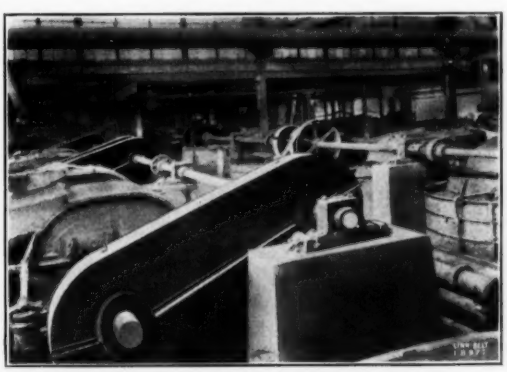
Toothed Chain Transmissions

Likewise, there are numerous drive services in pulp and paper mills for which the toothed, or more commonly termed "silent", chains are admirably fitted. These toothed chains are much more familiar to the plant and operating engineers of the industry, of course, having been employed quite extensively for the past several decades, with quite general success and satisfaction, for driving:

Agitators	Paper cutters	Line shafts
Beaters	Paper slitters	Governor drives
Washers	Power fans	Coating machines
Rewinders	Yankee driers	Jordan engines
Screens	Receiving driers	Stuff chests
Pumps	Drying rolls on	Elevators
Calenders	paper machines	Conveyors

The reasons generally held responsible for this wide range of applications in the mills of the paper making industry are that the drives operate with marked smoothness, when properly installed, at an efficiency of well over 98 per cent and that they are extremely long lived and free from upkeep expenses. These reasons are highly important, of course, but there are other advantages possessed by and more or less peculiar to a properly adjusted toothed chain transmission, with plenty of slack, that may be of equal or even greater importance in pulp and paper mill services, chief among which is probably the fact the damp and hot atmospheric conditions prevalent in the mills do not effect the satisfactory operation of a correctly installed toothed chain drive.

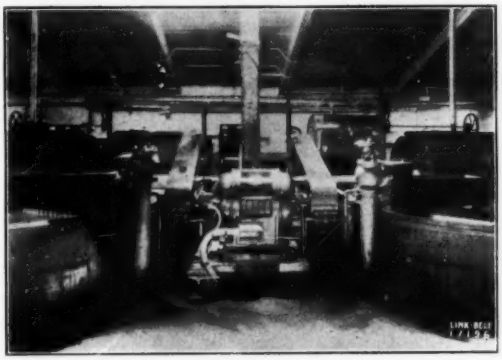
The fact that toothed chains are little effected by atmospheric conditions or by sudden and marked variations in temperature and humidity may prove of very decided benefit to almost any pulp or paper mill. This point has been brought out forcibly by experiences in some of the southern mills, where operating conditions imposed by atmospheric conditions are apt to be particularly troublesome.



Courtesy: Link-Belt Co.

FIG. 5

Part of twenty-one 100-h. p. toothed chain drives operating feeders from lineshafts at a New Jersey establishment.



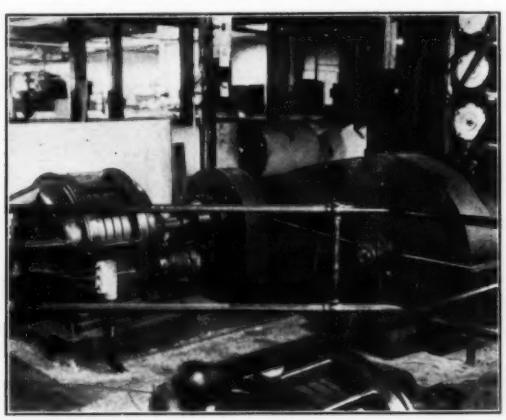
Courtesy: Link-Belt Co.

FIG. 6

Two 75 h. p. toothed chains operating beaters from double ended motor at a plant in Delaware.

A case in point was the difficulty found in satisfactorily driving four large beaters at the Camden (Ark.) plant of the Southern Kraft Corporation, a subsidiary of the International Paper Company. These 200-horsepower drives were originally equipped with "V" belts, but after considerable expensive experimentation with various forms and makes of these belts it was found that much better results were secured with toothed chain drives, the latter being virtually trouble-free from changes in atmospheric conditions. Another saving attributable to toothed chain drives clearly demonstrated at this plant is the fact that these chains may be uncoupled without incurring the expense of moving the beater shafts from their bearings, an operation necessary when employing "V" belts, in order to make it possible to slide the belts over their sheaves. Both economy in labor charges and saving in loss of production, due to materially cutting down the time entailed for adjustments, favors the toothed chain application.

A high speed ratio may be secured with a toothed chain drive on shorter center distances than are feasible with any other form of drive, other than one effected through toothed gearing. The compactness of the drive may even be on a par with that of ordinary gearing, for while the center distance is necessarily slightly greater in the case of



Courtesy: Morse Chain Co.

FIG. 7

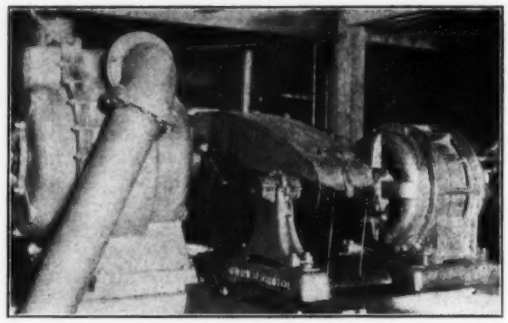
Four of these 100 h. p. toothed chain transmissions drive super-calenders at the Falulah Paper Co., Fitchburg, Mass.

the toothed chain drive, the fact that many more teeth are brought into service at the one time in chain drives than in gear drives may actually permit a saving in the face width of drive.

The slackness of the properly installed toothed chain drive tends to hold down journal friction and adds greatly, of course, to the flexibility of the drive. Nevertheless, advantage should not be taken of this fact to excuse carelessness in the maintenance of accurate alignment between shafts. With certain varieties of toothed chain constructions, it is true, the misalignment of shafts is more troublesome than with others, but irrespective of the variety of toothed chain employed the correct alignment of shafts is a prerequisite for the satisfactory operation of the drives. Otherwise, wear is not only excessive but unequal and the effectiveness of the transmission is seriously impaired, with rapid destruction of the chain. Properly installed, on the other hand, with the shafts maintained in accurate parallel alignment, the longevity of toothed chain drives is marked and upkeep expenses exceedingly low.

The Brown Company, at Berlin, N. H., has employed toothed chain drives throughout its mill for more than fiftcen years, while the Neenah Paper Company, at Neenah, Wis., installed six such drives, aggregating 775-horsepower, in 1912, which to date have contracted a total repair bill of $6.00. Somewhat less impressive, but decidedly noteworthy, is the experience of the Nekoosa-Edwards Paper Company with four 150-horsepower toothed chain drives installed on beaters in 1923, the average repair bill on which has been $10.61 per year per drive. The two 150-horsepower drives on beaters at the Stevens Point, Wis., plant of the Consolidated Water Power and Paper Company are reported to have entailed no repair expenses to date and a similar clean slate is claimed for the beater, toothed chain, drives installed by the Curtis & Brother Company, Newark, Del.

Similar records are far from being uncommon, but the foregoing, being quite typical, should suffice as demonstration of the long, carefree life frequently enjoyed by correctly installed and maintained toothed gear transmissions. Some comments upon individual installations from various mill users are perhaps of greater interest, not only in convincing confirmation of the common freedom of properly installed toothed chain drives from repair expenses, but also in focussing attention upon other features which to certain mills have proved to be of noteworthy importance. Before presenting these endorsements, for the comments are generally of a commendatory nature, however, reference can well be made to one more specific application, the installation made by the Waterway Paper Products Company of Chicago, the application of toothed chain drives to *Shartle* beaters. This particular use of toothed chain drives is a most exacting one and is of especial interest, not only because it was the first adaptation of such drives to this particular purpose, but because it was a successful solution of what is generally conceded to be one of the hardest drive services, if not the most exacting, in a paper mill.



Courtesy: Morse Chain Co.

FIG. 9

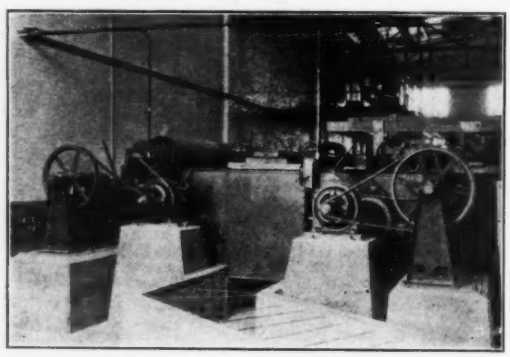
125 h. p. toothed chain drive operating a vacuum pump at a prominent paper mill down east.

Comments by Mill Users

Advancing reasons for the excellent results so frequently secured with toothed chain drives, one experienced user of such transmissions lists their advantages in the following positive manner: "They save space, they do not stretch, there is no slippage, they are easier on the bearings and motors, they are less dangerous, their initial cost is usually less and their operating cost is far more economical." Another mill user advises: "We can replace a chain in a couple of hours. It formerly took a gang of men two days to take out the driving shaft and remove the gear."

Other comments are: "The thing that pleases us most about (toothed chains) is that we can install them and forget them." "Leather belts lasted us two or three years at the most, while our (toothed chain) drives have already lasted three or four times that long and seem good for many more years."

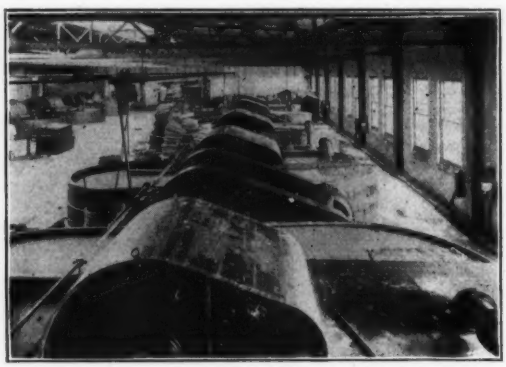
Still other users advise: "In the first place, by this replacing our leather belts we save considerable power, due to the total elimination of slippage. Second, we are no longer forced to buy three or four new belts every year, due to the damaging effect our chemicals have on leather. Third, we have stopped delays with their resulting losses,



Courtesy: Morse Chain Co.

FIG. 8

Ground wood deckers driven by 15 h. p. motors and toothed chain transmissions at the Thunder Bay Paper Co. plant at Port Arthur.



Courtesy: Morse Chain Co.

FIG. 10

80 h. p. toothed chain drives from motors to beaters.

caused by broken belts." Another pertinent comment is: "Belts would have required a new building and gears wear down and get out of line, making it necessary to have them reset too often for economical operation—and besides, (toothed chains) saved us $4,000.00 over the cost of gears."

The Mill Superintendent of a prominent New England establishment writes: "At the present time, we are utilizing the service of ten (toothed chains), all of them being in use on paper beating mills. Eight of the chains were installed two and one-half years ago; four of them on 75-horsepower motors and four on 40-horsepower motors; and a few months ago we added two more chains on the 75-horsepower motors.

"One great advantage of the (toothed chains) and one which prompted us to use them is the large amount of space conserved through their use. To operate the beating mills now using (toothed chains) with belting would require better than 30 per cent additional space, because of the fact that the centers would have to be practically doubled. It would be next to impossible to use belts on our present short centers. Further, the short life of belts would be much against them for this work, for the chains are running constantly twenty-four hours of the day."

Chain Drives Should Still Be Used

These endorsements and the various toothed chain applications in pulp and paper mill services previously cited have been presented in this manner in an attempt to show that the chain drive is far from being obsolete, as yet. No attempt has been made to discuss the technical aspects of chain constructions and the emphasis placed upon certain types of chain drives should be attributed to the need of plentiful evidence to combat the contention that the death knell of chain drives has been or will soon be sounded. The chain drive may eventually have to give way to a better means of effecting power transmission, but it is still looked upon with favor by many mills and many engineers.

A well informed expert on all forms of power transmitting equipment expresses the opinion that toothed chain drives are one of the most economical equipments available. He also calls attention to the fact that in the boom years of 1927, 1928 and 1929, industries in general grew quite extravagant in purchasing equipment, including power transmission. Many mill superintendents equipped their plants with various transmissions yet to prove their worth in years of service, on the theory, it would seem, that they were willing to try anything once, provided it looked good. If the device or contrivance was held to be the latest development, that was sufficient.

In these days of painful recovery from boom psychology, it is encouraging to note that most superintendents are turning toward tried equipment and are demanding proves of longevity and of freedom from repair and replacement expenses. Looked at from these angles, the appropriate and properly installed chain drive will stand as severe an investigation as any other means of power transmission.

Acme Paper Co. Starts at Indianapolis

INDIANAPOLIS, Ind., January 4, 1932—The opening of a new wholesale paper house here, The Acme Paper Company at 1502 Madison avenue, has been announced by Louis R. Rosen, head of the company. The new firm will be distributors for wrapping paper, tissues and other products and will specialize on nationally advertised merchandise. Mr. Rosen, a local man, has been in the paper industry many years. He was associated with the Standard Paper Company here and later with the Capitol Paper Company before opening his own firm.

Tube-Turns Prices Reduced

Substantially lower prices apply to all Series IR Tube-Turns, a new series of the seamless, uniform-wall fittings for pipe welding just announced by the manufacturers, Tube-Turns, Incorporated, Louisville, Ky.

Like all other Tube-Turns, the new Series IR fittings are seamless. They are made by the exclusive Tube-Turn process, which produces uniform wall-thickness at all points, insures uniform radius and eliminates all locked-in stress in the metal. Like all other Tube-Turns, the new Series IR also has the same outside diameter, the same inside diameter and the same wall thickness and wall tolerance as the pipe with which it is used. This, together with the fact that it is made of the same material, is said to greatly facilitate lining up and welding.

The addition of the new Series IR rounds out and completes the Tube-Turn line, according to the announcement, affording 45 degrees and 90 degrees elbows and 180 degrees return-type fittings for welding in sizes ¾ inches through 20 inches and in virtually all the weights required by modern piping.

Tube-Turns, Incorporated, pioneered fittings for welding in this country and its product has been accepted as the standard.

Series IR Tube-Turns are carried in stock by all Tube-Turn distributors. The announcement invites requests for descriptive literature and prices.

Not to Remove De Grasse Machinery

[FROM OUR REGULAR CORRESPONDENT]

PYRITES, N. Y., January 4, 1932—Rumors that the International Paper Company is planning to remove a portion of the equipment in the De Grasse mill here to other branches have been denied by officials. E. F. Gagnon, office manager of the local unit, stated that he had received several communications from the main office in which it was explained that the machinery would not be transferred and that production would be resumed as soon as market conditions improved sufficiently to permit such a move. It was rumored that representatives of the company had visited the local plant during the past week for the purpose of negotiating for removal of the equipment elsewhere but this was emphatically denied by Mr. Gagnon.

Only a skeleton working force has been employed here since operations were suspended in July, 1930. About a half dozen men comprise the working force including the office manager, caretaker and fireman. When running at full speed the company employs several hundred men in the local branch which is regarded as one of the largest units in Northern New York. The company also owns a large number of tenements here which are occupied by employees.

J. & J. Rogers Insure Employees

[FROM OUR REGULAR CORRESPONDENT]

AUSABLE FORKS, N. Y., January 4, 1932—Employees of the J. & J. Rogers Company have each been presented with a $500 insurance policy under the group insurance plan in appreciation of their services during the past year. The arrangement, however, affects only those who have been working for the company at least six months. Besides, each employee was the recipient this week of a ten dollar gold piece as a holiday gift from the company. In a letter to each employee, the management expressed the belief that the worst of the business depression is over and that in the very near future business will take an upward turn.

Obituary

Frank S. Robbins

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, January 4, 1932.—Following a brief illness, Frank S. Robbins, 53 years old, son of the late Sabin Robbins, founder of the Sabin Robbins Paper Company, Middletown, died at his residence in the Paper City. His death came as a shock to his family and friends. Funeral services were conducted by the Rev. A. L. Kemyon, Rector of the Church of the Ascension, Middletown. Interment was made in Spring Grove Cemetery, Cincinnati.

The Robbins family is one of the oldest in Middletown, dating back to the Sabin Robbins Paper Company's formation. With the remainder of the family, Frank Robbins was educated in the Middletown public schools and was graduated from the high school in that city. Later he attended Ohio State University, where he became a member of the Sigma Alpha Epsilon fraternity. Soon after his graduation from college, he became his father's representative in Chicago and remained in that city until 1927 when his health failed and he removed his family to Middletown.

Mr. Robbins was prominent in the circle of Willmette, a suburb of Chicago, where his family maintained its residence. He was affiliated with the Willmette Country Club and the Hamilton Club of Chicago. In his younger years, Mr. Robbins was a well-known athlete and sportsman. He won the intercollegiate championship at cycling while at college and later became state champion. Through his prowess in the sport he came to know Barney Oldfield, when the two entered cycling meets at county fairs throughout this district.

As half back on the Ohio State University football team, in the years 1898-9, he became nationally known to followers of the sport. Basketball and baseball were other favorite sports of Mr. Robbins, and he was a regular attendant at such contests.

Thomas W. Kitson

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., January 4, 1932—Thomas W. Kitson, salesman for John Carter & Co., Inc., for several years, covering Fitchburg, Worcester and adjoining territory a considerable period, died at the City hospital Tuesday. The funeral took place Thursday from his residence in Wollaston, Mass. Mr. Kitson was well and favorably known in the trade. His son, Thomas E. Kitson, is a member of the staff of John Carter & Co. A wife is living.

Raymond J. Parham

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., January 2, 1932—Raymond J. Parham, general sales manager of the St. Regis Paper Company, died this week at the St. Luke's Hospital in New York City following a lingering illness. He had been confined there for several weeks following an operation for a tumor of the brain. He was born in this city in 1883 and was educated in the public schools.

He became connected with the St. Regis Paper Company in 1912, when he secured a position in the purchasing department. His efforts won the commendation of officials and a few years later he was transferred to the sales department. Promotion continued and he was finally made general sales manager, which post he held at the time of his death. Several years ago when the main offices were moved to New York City it was decided that Mr. Parham would be transferred also and he has resided at Scarsdale since that time.

He was prominent in many of the leading fraternal organizations in Northern New York. His wife and a daughter are the principal survivors.

J. O. Woodsome

J. O. Woodsome, prominent engineer in the paper and pulp field for 25 years, passed away at his summer home in Lebanon, Me., December 26, 1931.

He was born at Boston, 1882. Since 1907 he has been interested in pulp and paper drying, having originated the Crane system and then brought out the Woodsome and Penberthy systems. For the past seven years he has been associated with the Penberthy Injector Company, at Detroit, Mich.

He was one of the outstanding engineers on drying in the paper field and a member of TAPPI for many years.

Lee J. Prunty

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., January 2, 1932—Lee J. Prunty, construction engineer for the Farnsworth Company, died at the hospital here this week following a brief illness. He was operated on for appendicitis about two months ago and complications developed which caused his death. He was 48 years old.

He had been connected with the Farnsworth Company for about twenty years and the duties of his position brought him to all sections of the country as an erecting engineer. The offices of the Farnsworth Company were removed from Conshohocken, Pa., early last spring to the Bagley & Sewall plant here following negotiations. Fred C. Farnsworth, of this city, is president of the company.

The survivors include his wife, a brother and three sisters.

Robert L. Burns

Robert L. Burns, plant engineer for the Mosinee Paper Mills Company, Mosinee, Wis., passed away on December 24, following a stroke of apoplexy which occurred while he was driving to work on Monday morning, December 21.

Mr. Burns has been engineer for the Mosinee Paper Mills Company for the past fifteen years and has taken an active part in the progress and development made in the kraft industry.

He is survived by Mrs. Burns, who will continue to live in Mosinee; one son, Alvin A. Burns, who lives in St. Louis; and a brother, William Burns, of Merrill, Wis.

Boston Paper Trade Optimistic

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., January 4, 1932—Quiet prevailed the last week of the year in the paper trade here, in fact, it is usually the quietest of the year. The trade is hopeful for an increase in the volume of sales in 1932, although there was no great improvement in the closing days of 1931. One of the most encouraging signs is the large number of inquiries which continue to come in from printers. The demand for wrapping paper has been fair. In some quarters a considerable volume of orders for specialties was placed in December for delivery the present month. Box board is not very lively, although the trade is looking forward to a little more activity in the not far distant future. The paper stock situation does not show much change, although possibly it is somewhat better in some respects than it had been.

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NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING JANUARY 2, 1932

SUMMARY

Cigarette paper ..... 361 cs.
Wall paper .....56 bls., 8 cs.
Paper hangings .....6 bls., 3 cs.
Wall board .....500 bdls.
News print .....5087 rolls
Printing paper .....68 rolls, 21 bls., 101 cs.
Wrapping paper ..... 19 cs.
Packing paper .....1 bl., 6 cs.
Colored paper ..... 11 cs.
Decalcomania paper ..... 37 cs.
Transfer paper ..... 3 cs.
Filter masse ..... 130 bls.
Filter paper .....33 bls., 3 cs.
Drawing paper ..... 37 cs.
Baryta coated paper .....29 crates, 1 cs.
Surface coated paper ..... 54 cs.
Metal paper ..... 22 cs.
Photo paper ..... 6 cs.
Writing paper ..... 1 cs.
Blotting paper ..... 3 cs.
Tar paste board .....40 crates
Tissue paper .....10 pkgs., 10 cs.
Card board ..... 2 cs.
Stencil paper ..... 18 cs.
Miscellaneous paper ..... 36 cs.

CIGARETTE PAPER

Champagne Paper Corp., Sarcoxie, Havre, 274 cs.
Standard Products Corp., Majestic, Southampton, 34 cs.
Liggett & Myers Tobacco Co., Majestic, Southampton, 20 cs.
Brown & Williamson Tobacco Co., Majestic, Southampton, 10 cs.
Gluckman & Strauch, Pr. Roosevelt, Hamburg, 5 cs.
Max Spiegel & Son, Pr. Roosevelt, Hamburg, 18 cs.

WALL PAPER

Kensington Wallpaper Co., Gen. von Steuben, Bremen, 9 bls.
R. F. Downing & Co., Amer. Banker, London, 11 bls.
Thomas & Pierson, Amer. Banker, London, 1 cs.
Guaranty Trust Co., Deutschland, Hamburg, 7 cs.
Globe Shipping Co., Deutschland, Hamburg, 13 bls.
J. E. Bernard & Co., Deutschland, Hamburg, 3 bls.
F. A. Binder, Deutschland, Hamburg, 20 bls.

PAPER HANGINGS

W. H. S. Lloyd & Co., Amer. Banker, London, 6 bls., 3 cs.

WALL BOARD

——, Pr. Roosevelt, Hamburg, 500 bdls.

NEWS PRINT

Bank of Montreal, Humberarm, Cornerbrook, 3357 rolls
Parsons & Whittemore, Inc., Amer. Shipper, Hamburg, 148 rolls.
Jay Madden Corp., Chickasaw, Kotka, 553 rolls.
Jay Madden Corp., Gen. von Steuben, Bremen, 645 rolls.
Perkins Goodwin & Co., Pr. Roosevelt, Hamburg, 338 rolls.
Jay Madden Corp., Pr. Roosevelt, Hamburg, 46 rolls.

PRINTING PAPER

C. Steiner, Gen. von Steuben, Bremen, 30 cs.
——, Gen. von Steuben, Bremen, 13 cs., 21 bls., 68 rolls.
Globe Shipping Co., England Maru, Hamburg, 6 cs.
P. C. Zuhlke, Westernland, Antwerp, 30 cs.
E. Dietzgen & Co., Deutschland, Hamburg, 12 cs.
Hensel Bruckman & Lorbacher, Deutschland, Hamburg, 2 cs.
Martin & Bechtold, Deutschland, Hamburg, 8 cs.

WRAPPING PAPER

Borden Riley Paper Co., Gen. von Steuben, Bremen, 13 cs.
Sylvania Industrial Corp., Westernland, Antwerp, 3 cs.
Gevaart Co. of America, Westernland, Antwerp, 1 cs.
R. McBratney, Baltic, Liverpool, 1 cs.
Craggs & Smith, Baltic, Liverpool, 1 cs.

PACKING PAPER

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COLORED PAPER

S. Gilbert, Gen. von Steuben, Bremen, 2 cs.
P. H. Petry & Co., Gen. von Steuben, Bremen, 5 cs.
M. J. Corbett & Co., Deutschland, Hamburg, 4 cs.

DECALCOMANIA PAPER

C. W. Sellers, Gen. von Steuben, Bremen, 6 cs.
C. W. Sellers, Deutschland, Hamburg, 2 cs.
Phoenix Shipping Co., Deutschland, Hamburg, 3 cs.
B. F. Drakenfeld & Co., Baltic, Liverpool, 18 cs. (duplex); 8 cs. (simplex).

TRANSFER PAPER

American Express Co., Amer. Banker, London, 1 cs.
Fuchs & Lang Manfg. Co., Amer. Shipper, Hamburg, 2 cs.

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P. H. Petry & Co., England Maru, Hamburg, 100 bls.

FILTER PAPER

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——, Exeter, Marseilles, 33 bls.
A. Giese & Son, Deutschland, Hamburg, 1 cs.

DRAWING PAPER

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H. S. Head, Deutschland, Hamburg, 1 cs.

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Globe Shipping Co., Hannover, Bremen, 29 crates, 1 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Westernland, Antwerp, 54 cs.

METAL PAPER

K. Pauli Co., Pr. Roosevelt, Hamburg, 5 cs.
K. Pauli Co., Deutschland, Hamburg, 14 cs.
Taub Hummell & Schnall, Deutschland, Hamburg, 3 cs.

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J. J. Gavin, Majestic, Southampton, 4 cs.
Medo Photo Supply Co., Amer. Banker, London, 1 cs.
American Express Co., Deutschland, Hamburg, 1 cs.

WRITING PAPER

Meadows Wye & Co., Majestic, Southampton, 1 cs.

BLOTTING PAPER

J. & H. Berge, Boston City, Bristol, 3 cs.

TAR PASTE BOARD

De Grauw Aymar & Co., Exilona, Genoa, 40 crates.

TISSUE PAPER

Jay Madden Corp., Chickasaw, Kotka, 10 pkgs.
W. J. Byrnes, Majestic, Southampton, 1 cs.
Meadows Wye & Co., Baltic, Liverpool, 4 cs.
B. F. Drakenfeld & Co., Baltic, Liverpool, 5 cs.

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Gevaert Co. of America, Westernland, Antwerp, 2 cs.

STENCIL PAPER

Frankel Carbon & Ribbon Manfg. Co., Majestic, Southampton, 1 cs.
Miller Davis & Co., Pr. Roosevelt, Hamburg, 3 cs.
Wedeman Godknecht & Lally, Inc., Deutschland, Hamburg, 13 cs.
Bush Service Corp., Deutschland, Hamburg, 1 cs.

MISCELLANEOUS PAPER

C. L. Voorhees, Tai Shan, Yokohama, 6 cs.
Keller Dorian Paper Co., Majestic, Southampton, 2 cs.
Van Oppen & Co., Exeter, Genoa, 26 cs.
Walker Goulard Plehn Co., Deutschland, Hamburg, 2 cs.

RAGS, BAGGINGS, ETC.

E. Mayer, Amer. Shipper, Hamburg, 13 bls. rags.
Bank of N. Y. & Trust Co., Amer. Shipper, Hamburg, 118 bls. rags.
V. Galaup, Sarcoxie, Havre, 129 bls. rags.
Darmstadt Scott & Courtney, Sarcoxie, Havre, 133 bls. bagging.
Chemical Bank & Trust Co., Gen. von Steuben, Bremen, 46 bls. rags.
Chase National Bank, Gen. von Steuben, Bremen, 321 bls. tares.
——, J. Jadot, Antwerp, 77 bls. fibre waste.
Banco Coml. Italiana Trust Co., Exeter, Genoa, 130 bls. bagging.
Darmstadt Scott & Courtney, Waukegan, Havre, 46 bls. bagging.
Darmstadt Scott & Courtney, Pr. Roosevelt, Hamburg, 7 bls. rags.
Chase National Bank, Deutschland, Hamburg, 82 bls. rags.
Martanco Stamp Co., Baltic, Liverpool, 8 bls. waste paper.

GLUE STOCK

Amtorg Trading Corp., Argosy, Leningrad, 350 bags.

HIDE GLUE

Amtorg Trading Corp., Chickasaw, Leningrad, 120 bags.
——, Gen. von Steuben, Bremen, 100 bags.
——, Deutschland, Hamburg, 30 bags.

OLD ROPE

Brown Bros. Harriman & Co., Boston City, Bristol, 67 coils.

CHINA CLAY

Wilson Paterson & Gifford, Boston City, Bristol, 50 casks.
Wilson Paterson & Gifford, Baltic, Liverpool, 60 bags.

WOOD PULP

Irving Trust Co., Hannover, Bremen, 125 bls. wood pulp.
——, Chickasaw, Kotka, 260 bls. sulphate, 52 tons; 170 bls. sulphite, 28 tons.
——, Chickasaw, Wiborg, 768 bls. wood pulp, 132 tons.
Lagerloef Trading Co., Chickasaw, Wiborg, 260 bls. wood pulp, 52 tons.
Castle & Overton, Inc., Chickasaw, Wiborg, 495

(Continued on page 54)

WOOD PULP
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Glens Falls Machine Works

GLENS FALLS, N. Y.

Manufacturers of

IMPROVED ROGERS AND SPECIAL WET MACHINES

STANDARD WET MACHINES

GLENS FALLS ROLLING ACTION FLAT SCREEN

THE A. D. WOOD SAVEALL, THICKENER, WASHER AND WATER SCREEN

GLENS FALLS DECKER AND DECKER WASHER

GLENS FALLS ROTARY SULPHUR BURNER

PULP GRINDERS, THREE OR FOUR POCKET (Roller Bearings)

Ask us about the
OLIVER-ROGERS WET MACHINE

TI MACHINE SEMI-STEEL
SECTIONAL BURRS

Manufactured in 3, 4, 5, 6 and 7 cuts per inch.

3" Diam.

SHARP — STRONG — TOUGH

ILLUSTRATION SHOWS ½ SIZE

OTHER SPECIALTIES

WARREN IMPROVED CALENDER With flexible blades, Universal Adjustment and Control, Patented — DOCTORS

WARREN IMPROVED DOUBLE DRUM— — WINDER

BALL HYDRANT for Stock Circulating Systems — VALVES

AND OTHER PAPER MILL MACHINERY

MANUFACTURED BY
TICONDEROGA MACHINE WORKS
TICONDEROGA, N. Y.
SEND FOR BULLETINS—ASK FOR PRICES.

Imports of Paper and Paper Stock

(Continued from page 52)

bls. wood pulp, 98 tons.
Lagerloef Trading Co., Chickasaw, Helsingfors, 1247 bls. sulphate, 208 tons.
Irving Trust Co., Gen. von Steuben, Bremen, 1000 bls. wood pulp.
——, Pr. Roosevelt, Hamburg, 169 bls. wood pulp, 25 tons.
Castle & Overton, Inc., Pr. Roosevelt, Hamburg, 218 bls. wood pulp, 32 tons.

WOOD PULP BOARDS

Lagerloef Trading Co., Chickasaw, Kotka, 54 bls., 8 tons.

BOSTON IMPORTS

WEEK ENDING JANUARY 2, 1932

F. W. Gerry & Co., Hannover, Bremen, 6 cs. wall paper.
T. D. Downing & Co., Hannover, Hamburg, 2 cs. parchment paper.
——, Hannover, Hamburg, 200 bags hide glue.
Davies Turner & Co., Hannover, Hamburg, 4 cs. color paper.
Stone & Downer, Hannover, Hamburg, 8 cs. metal paper.
Castle & Overton, Inc., Hannover, Hamburg, 1375 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING JANUARY 2, 1932

Congoleum Nairn Co., Waukegan, Havre, 618 bls. rags.
Parsons & Whittemore, Inc., City of Havre, ——, 435 bls. sulphite.

NORFOLK IMPORTS

WEEK ENDING JANUARY 2, 1932

Darmstadt Scott & Courtney, Waukegan, Havre, 151 bls. rags.

PHILADELPHIA IMPORTS

WEEK ENDING JANUARY 2, 1932

Parsons & Whittemore, Inc., Hannover, Hamburg, 162 rolls news print.
Castle & Overton, Inc., Hannover, Hamburg, 1370 bls. wood pulp.
Universal Car-Loading Co., Hannover, Bremen, 4 bls. wall paper.
J. Anderson & Co., Hannover, Bremen, 539 bls. wood pulp.
Irving Trust Co., Hannover, Bremen, 300 bls. wood pulp.
Castle & Overton, Inc., Sarcoxie, Havre, 71 bls. rags.
——, Chickasaw, Kotka, 1560 bls. sulphate, 312 tons; 870 bls. sulphite, 174 tons.
Lagerloef Trading Co., Chickasaw, Kotka, 169 bls. sulphite, 25 tons; 1130 bls. mechanical pulp, 226 tons.
Neidich Process Co., Chickasaw, Kotka, 36 cs. tissue paper.
Lancaster News, Chickasaw, Kotka, 51 rolls news print.
——, Chickasaw, Kotka, 56 rolls news print.
——, Chickasaw, Wiborg, 11516 bls. sulphite, 2073 tons; 500 bls. sulphate, 100 tons.
Castle & Overton, Inc., Chickasaw, Wiborg, 363 bls. sulphite, 72 tons.
Parsons & Whittemore, Inc., Hjelmaren, ——, 600 bls. sulphite.

American Writing Tenders Silver

HOLYOKE, Mass., January 5, 1932—The American Writing Paper Company, Inc., Saturday repeated its offer of six months ago to pay its water rentals with silver bullion and was again formally refused by the Holyoke Water Power Company. Treasurer William J. Norton and Attorney Russell L. Davenport appeared for the writing paper company and made proffer of it for payment for the past six months rentals amounting to about $12,000. President Robert E. Barrett and Attorney Nathan P. Avery received the envoys. They met in the office, legal papers were read, and Attorney N. P. Avery after viewing the bullion officially refused payment. The American Writing Paper Company, Inc., now owes or rather the Holyoke Water Power Company asserts that it owes water rentals for 18 months amounting in round numbers to about $36,000.

The tender is based on an old clause in a contract of many years ago that permitted the payment in either gold or silver at the option of the grantee. The clause is not wholly clear and has never been judicially interpreted.

Delthirna Process

The American Delthirna Corporation has just issued a bulletin describing its sizing process, illustrating several of its producing units along with specifications covering rosin capacity from 333 lbs. to 5000 lbs. It also carries a number of testimonials from leading mills making various grades of pulp and paper, giving list of paper and pulp mills in the United States and Canada which have installed the Delthirna Process within the past year. A copy of this bulletin may be obtained by writing Mansfield, Bolton & Kent, Inc., 501 Fifth avenue, New York, who are the selling agents for this process for the United States.

Parker-Young Co. Move Offices

BOSTON, January 4, 1932—Announcement has just been made by the Parker-Young Company, of removal of their offices from 131 State street, where they have been located for a number of years, to new offices at 148 State street, which will be the headquarters for their sales organization. The accounting department, which had also been located at 131 State street, has been moved to their plant at Lincoln, N. H.

Not To Affect Norwegian Paper Exports

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., January 5, 1932—A report to the Department of Commerce states that the present British emergency tariff will have little effect on Norwegian paper exports to that country, inasmuch as printing paper, including news print, continues on the free list. Neither are the different grades of pulp affected. A duty of 50 per cent ad valorem is equivalent to an import embargo, since none of the other paper producing countries enjoy corresponding advantages in production costs. It is to be expected, therefore, that Norway's exports of wrapping paper to the United Kingdom will be lost while this tariff remains in effect. During 1930 such exports totaled 35,000 metric tons, comprising 20,600 tons of kraft paper, 10,000 tons of greaseproof paper, and 4,400 tons of other wrappings.

Start Paper Machines at Fort Edward

FORT EDWARD, N. Y., January 5, 1932—The machines at the local branch of the International Paper Company were started up early last week but the length of time they will keep running could not be learned. The mill has been running on uncertain schedules for some time past and many of the employees have been compelled to seek positions elsewhere.

Operations at the Corinth plant are being conducted on a near capacity basis with a force of several hundred workers. Financial difficulties encountered by the Corinth National Bank has resulted in the payroll being held up and officials are still undecided as to the manner in which the wages will be distributed.

Connecticut Division to Meet

[FROM OUR REGULAR CORRESPONDENT]

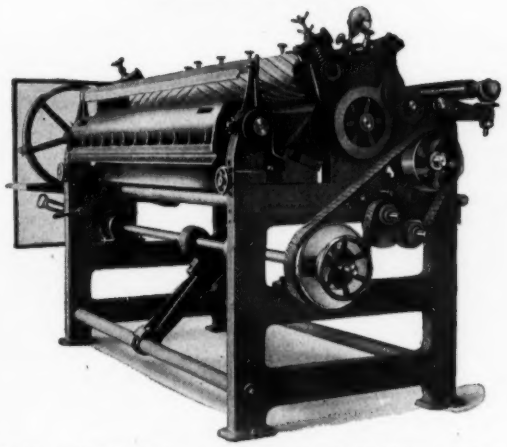
HOLYOKE, Mass., January 5, 1932.—The January meeting of the Connecticut Valley Division of the American Paper and Pulp Mill Superintendents Association will be held January 16 at the Hotel Nonotuck. The committee is busily working on the program. The meeting will open with a dinner at 6.30 o'clock followed by a business meeting. Several important papers will be given and there will be the usual lively "Question Box" period. The committee in charge of arrangements consists of Claude Smith, chairman; Ernest Bush, Richard F. Driscoll, John J. White and Forbes Wood.

Cotton and Paper Rolls
Super Calenders
Friction Calenders
Embossing Calenders
Hydraulic Presses and Pumps

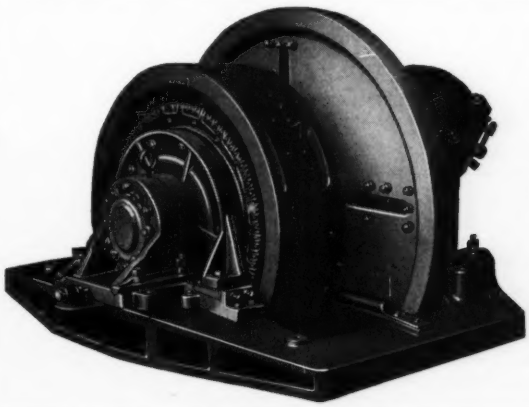
Successors to the Granger Foundry & Machine Co.

The Textile-Finishing Machinery Company
PROVIDENCE, R. I.

MODEL 28
ROLLER BEARING CUTTER



HAMBLET MACHINE CO.
LAWRENCE, MASS.
MAKERS OF
SINGLE, DUPLEX AND DIAGONAL PAPER CUTTERS,
CUTTER KNIVES, PATENT TOP SLITTERS.



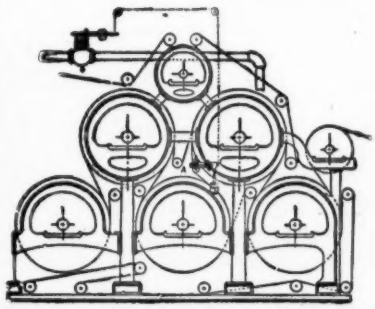
MURRAY PULPWOOD CHIPPERS

MURRAY built the first roller bearing chipper ever produced, nearly 8 years ago and the first direct-connected chipper nearly 4 years ago—and improvements are being made as fast as they are discovered.

Murray Chippers are ruggedly constructed for heavy duty and are designed to cut mill costs to a minimum. They save power, produce better chips with less sawdust and give satisfactory, trouble-free service. Write for descriptive literature.

D. J. MURRAY MFG. CO., WAUSAU, WIS.

The Pickles Drying Regulator



WE ARE SAFE IN OUR PROPOSITION
YOU'LL MAKE NO MISTAKE IN ACCEPTING IT

Pickles Drying Regulator

will do everything we claim for it and more. The test costs you nothing until you are satisfied. Many mills tried one and now have every machine equipped. Write for list of users and other information.

W. F. PICKLES **Buckland, Conn.**

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, January 6, 1932

Conditions in the local paper market are fairly satisfactory, considering the general business depression. While trading has been light, following the usual holiday rush, stocks in the hands of distributors and dealers are not believed to be excessive, and the industry is in a good position for expansion. Prices continue irregular.

News print production is being maintained at approximately 55 per cent of capacity in the North American continent and shipments against contract are going forward at about the same pace. Efforts are still being made by the leading operators to stabilize the industry and the outlook for the future is fairly encouraging.

The paper board market continues to mark time. Production was considerably curtailed during the holidays but should expand materially in the immediate future. Demand for the various standard grades of fine paper is moderately persistent. The coarse paper market is steadier. Production of kraft wrapping paper is being maintained at about 60 per cent of capacity.

Mechanical Pulp

Although the ground wood market was very quiet during the past week, the industry is considered to be in a strong statistical position. Both at home and abroad production has been curtailed for some time past and accumulations are limited. Prices are holding to the schedule which has been in force during the last several months.

Chemical Pulp

Seasonal conditions prevail in the local chemical pulp market. Some improvement was noticed in the demand for several of the various grades of imported and domestic chemical pulp. Inquiries for future delivery are fairly numerous, some of which should materialize into good business. Prices are generally holding to formerly quoted levels.

Old Rope and Bagging

The old rope market continues very quiet. Paper mill demand for both foreign and domestic old manila rope is decidedly restricted at present. Small mixed rope is dull. Prices are somewhat easier. The bagging market is fairly active for the time of year. Scrap and gunny bagging are moving in moderate volume. Roofing bagging is listless.

Rags

While demand from the paper mills is restricted, due to the inevitable inventory lull, the domestic rag market is exhibiting a fairly strong undertone. Cotton rags are quiet at present but with stocks at the mills reported low, trading should become more lively in the near future. Domestic roofing rags are arousing more interest than of late. The imported rag situation is unchanged.

Waste Paper

Paper manufacturers have not been showing much interest in the paper stock market recently, due mainly to the holidays and the effects of the inventory period. The higher grades of waste paper continue fairly steady, especially book stock, which is going forward in satisfactory volume. Old kraft machine compressed bales are also in fair request. The lower grades are marking time.

Twine

Most of the business transacted in the local twine market during the past week was along routine lines. Demand for the various grades should expand materially now that the holidays are over. Prices are generally holding to formerly quoted levels and the outlook for the industry is fairly promising.

PENNSYLVANIA MILLS SLOW

(Continued from page 20)

Judge Wells, of Bordentown, N. J., and Dr. Greenaway, president of Beaver College. Morgan H. Thomas, president of the company, and Edwin A. Keller, its vice president, greeted the workers and after wishing them the season's compliments turned the session over to George Weaver, as Master of Ceremonies for the professional program and choral singing.

Charles J. Cohen Co. Issues New Price List

Having recently rebuilt and enlarged the envelope plant and its manufacturing equipment, the Charles J. Cohen Company, of 510 Ludlow street, is now prepared to expand production. The firm, one of the oldest manufacturers of envelopes in the East, has added new units of the latest type, having entirely replaced its old equipment with modern devices since rebuilding, after the fire that destroyed the old machinery. There has been issued a new revised price list which will be effective in 1932, and which reduces slightly many of the sizes of the Zenith envelopes, the firm's own make.

Alfred E. Chase Joins J. E. Reynolds Co.

Alfred E. Chase who, has been manager of the twine divisions of some of the leading paper houses in the Philadelphia district, has been appointed Quaker City manager of the J. E. Reynolds Company, large New York city twine distributors and one of the oldest twine brokers in the country. The Reynolds company has acquired local offices in Room 585, Drexel Building where the newly appointed manager will conduct the local sales. Manager Chase severed his connection as head of the D. L. Ward Company to open the Reynolds offices and was also with the Garrett Buchanan Company and the Fricke Company. He also had experience with the manufacturing division of the twine trade, having been affiliated with the American Manufacturing Company.

Woodland Section to Meet

The annual meeting of the Woodland Section of the Canadian Pulp and Paper Association will be held on January 27 and 28 at the head office of the association in Montreal. There will be a closed meeting on the first day of the convention, and an open meeting on the second day.

100 Tons Kraft Per Day — 58% A. D.
With the Famous Kamyr Wet Machine

Production . . . .

Kraft	up to 100 Tons
Sulphite	up to 80 Tons
Soda	up to 60 Tons
Groundwood	up to 50 Tons

Results . . . . . .

With 1 Press	42% A.D.
With 2 Presses	55% A.D.
With 2 Presses & Predryer.	58% A.D.

Saves . . . . . .

Felt, Wires, Labor, Upkeep, Power, Fibre, Floor Space

G. D. JENSSEN CO.

Chrysler Bldg., N. Y. C. *Sole Agents in U. S. A. for* 1017 White Bldg., SEATTLE

PAPER MACHINERY Ltd.
MONTREAL

Chemipulp Process

A method of recovering HOT gas and liquor in sulphite process

Saves Steam Saves Time Saves Sulphur
Increases Production
Eliminates Expensive Cooling Equipment
Reduces Boiler Peak Load Draw

CHEMIPULP PROCESS, INC.
330 Woolworth Bldg., Watertown, N. Y.
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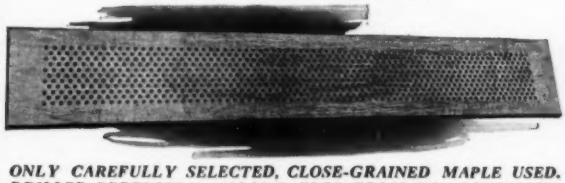
in Canada
319 Castle Bldg., Montreal, Que.

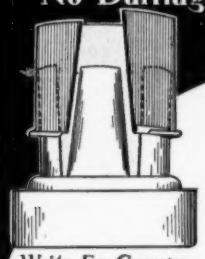
"M & W"
WOOD SUCTION BOX COVERS
PROLONG THE LIFE OF THE WIRES



ONLY CAREFULLY SELECTED, CLOSE-GRAINED MAPLE USED. DRILLED PERFECTLY SMOOTH. FREE FROM IMPERFECTIONS.

THE MOORE & WHITE COMPANY
Paper Machinery Builders Philadelphia, U. S. A.

No Damage To Paper On Inside Of Rolls



YOU CAN USE INEXPENSIVE PAPER CORES OR ROLLS WITHOUT CORES AND SAVE COST AND LABOR OF RETURNING CORES.

ONEIDA CHUCK

Key enters and expands clip, producing tight grip on inside of core end. Permits running down of paper to last thickness without damage to core. Safer, more efficient and economical than ordinary wedge chucks. Made to fit standard sizes of cores and shafts.

Write For Circular

JOHN WALDRON CORPORATION
Paper Converting Machinery Since 1827
MAIN OFFICE AND WORKS - NEW BRUNSWICK, N. J.

PAPER ROLL
PLUGS

Any quantity
10,000,000 Yearly
Capacity

Wood Products Co.
INC.
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LAND O'LAKES
CASEIN

High quality Casein made under strict laboratory control. Excellent solubility. Satisfactory viscosity. Write for sample and quotations.

LAND O' LAKES CREAMERIES, INC., MINNEAPOLIS, MINN.
New York City - Chicago - Boston - Philadelphia - Pittsburgh - Syracuse

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, January 6, 1932.

BLANC FIXE.—Trading in the blanc fixe market was moderately active. Prices remain unaltered. The pulp is quoted at from $42.50 to $45.00 per ton, while the powder is selling at from 3¼ cents to 3⅜ cents per pound, in barrels, at works.

BLEACHING POWDER.—The bleaching powder market was very quiet during the past week. The contract movement was fairly satisfactory. Prices are holding to schedule. Bleaching powder is quoted at from $1.75 to $2.00 per 100 pounds, in drums, at works.

CASEIN.—Dullness reigns in the casein market. Domestic standard ground is quoted at 7½ cents and finely ground at 8 cents per pound. Argentine standard ground is selling at 8½ cents and finely ground at 9½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—The position of the caustic soda market is sound. Prices are practically unchanged. Solid caustic soda is quoted at from $2.50 to $2.55, while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—Seasonal conditions prevail in the china clay market. The contract movement is moderately heavy. Prices are steady. Imported china clay is quoted at from $11 to $13 per ton. Domestic paper making clay is selling at from $7 to $11 per ton, at mine.

CHLORINE.—No radical changes were reported in the chlorine market. Demand from the paper mills was restricted, due to the holidays. Prices remain unchanged. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market was slightly weaker. The grades of gum rosin used in the paper mills are now quoted at from $3.45 to $3.80 per 280 pounds, in barrels, at works. Wood rosin is still selling at $3.80 per 280 pounds, in barrels, on dock.

SALT CAKE.—Steadiness continues to prevail in the salt cake market. Salt cake is still quoted at from $15 to $16; chrome salt cake at from $12 to $13 per ton, in bulk, at works. Imported salt cake is selling at from $14.50 to $15.00 per ton, ship side.

SODA ASH.—Demand for soda ash during the past week was listless, although contract orders for the coming year are being booked in good volume. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1; in bags, $1.25; and in barrels, $1.38.

STARCH.—The starch market is exhibiting a strong undertone at present and trading is fairly brisk, despite the holiday lull. Prices declined slightly. Special paper making starch is quoted at $2.54, in bags; and at $2.81, in barrels, per 100 pounds, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market was only moderately active. Prices are holding to schedule. Commercial grades are quoted at from $1.25 to $1.40; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—Quietness reigns in the sulphur market. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton for any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—The talc market is displaying a steady trend, with prices generally holding to formerly quoted levels. Domestic talc is selling at from $16 to $18 per ton, in bulk, at mine; while imported talc is offered at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@38.00
Bonds	5.00	@53.25
Index	6.00	@12.00
Writings—		
Extra Superfine	6.50	@15.00
Superfine	6.25	@14.75
Tub sized	4.50	@ 7.00
Engine sized	3.00	@ 5.00
Book, Cased—		
S. & S. C.	5.25	@ —
M. F.	5.00	@ —
Coated and Enamel	6.25	@ 9.75
Lithograph	6.75	@11.25
Tissues—Per Ream—		
White No. 1	.65	@ .70
Anti-Tarnish M. G. only	.65	@ .70
Colored	.70	@ .90
White No. 2	.55	@ .60
Kraft	.65	@ .70
Manila	.55	@ .60
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.00	@ 5.25
No. 2 Wood	3.50	@ 4.00
Butchers	3.37½	@ —
Fibre Papers—		
No. 1 Fibre	4.25	@ 5.50
No. 2 Fibre	4.00	@ 4.75
Common Bogus	1.50	@ 3.00
Screenings	2.00	@ 3.00
Card Middies	4.00	@ 5.00
Glassine—		
Bleached, basis 25 lbs., No. 1	.09¾	@ —
No. 2	.11¼	@ —
Bleached, basis 20 lbs.	.11¾	@ —

(Delivered New York)

News, per ton—		
Roll, contract	55.00	@ —
Rolls, spot	55.00	@ —
Sheets	60.00	@ —
Side Runs	40.00	@44.00
Kraft—		
No. 1 Domestic	4.50	@ 5.75
No. 2 Domestic	3.00	@ 4.25
Southern	2.75	@ 4.00
Imported	6.00	@ 7.00
Boards—per ton—		
News	24.00	@27.50
Straw	34.50	@45.00
Chip	24.00	@27.50
Binders' Boards	62.00	@70.00
Standard 85 Test Liner	32.50	@35.00
Sgl. Mla. Ll. Chip	32.50	@40.00

(F. o. b. Mill)

Wood Pulp Boards	70.00	@80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—		
Moist	22.00	@24.00
Dry	22.00	@24.00

(F. o. b. Mill)

No. 1 Domestic	25.00	@30.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	2.10	@ 3.50
Easy Bleaching	1.60	@ 1.75
No. 1 strong unbleached	1.50	@ 1.75
Mitscherlich unbleached	1.55	@ 1.75
No. 2 strong unbleached	1.40	@ 1.50
No. 1 Kraft	1.50	@ 1.75
No. 2 Kraft	1.40	@ 1.50
Sulphate—		
Bleached	2.35	@ 2.50

(F. o. b. Pulp Mill)

Sulphite (Domestic)—		
Bleached	2.00	@ 4.00
Easy Bleaching	1.75	@ 1.90
News	1.50	@ 1.65
Mitscherlich	2.40	@ 2.55
Kraft (Domestic)	1.60	@ 2.75

(Delivered Paper Mills)

Soda Bleached	2.50	@ —

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	6.50	@ 7.00
New White, No. 2	5.50	@ 6.00
Silesias No. 1	5.25	@ 5.50
New Unbleached	7.00	@ 7.50
New Blue Prints	4.00	@ 4.50
New Soft Blacks	3.50	@ 4.00
Blue Overall	5.00	@ 5.25
Fancy	3.00	@ 3.50
Washables	2.75	@ 3.00
Mixed Khaki Cuttings	3.50	@ 4.00
Pink Corset Cuttings	5.00	@ 5.50
O. D. Khaki Cuttings	4.50	@ 4.75
Men's Corduroy	3.00	@ 3.50
New Mixed Blacks	3.00	@ 3.25

Old Rags

White, No. 1—		
Repacked	5.25	@ 5.75
Miscellaneous	4.25	@ 4.75
White, No. 2—		
Repacked	3.00	@ 3.50
Miscellaneous	2.30	@ 2.50
St. Soiled, White	1.50	@ 1.75
Thirds and Blues—		
Repacked	2.25	@ 2.50
Miscellaneous	1.65	@ 1.85
Black Stockings	3.25	@ 3.75
Roofing Rags—		
Cloth Strippings	1.25	@ 1.30
No. 1	1.25	@ 1.30
No. 2	.90	@ 1.00
No. 3	.70	@ .80
No. 4	.65	@ .70
No. 5A	.50	@ .60

Foreign Rags

New Rags

New Dark Cuttings	1.50	@ 1.60
New Mixed Cuttings	2.00	@ 2.20
New Light Silesias	3.80	@ 4.00
Light Flannelettes	4.25	@ 4.50
Unbleached Cuttings	6.00	@ 6.25
New White Cuttings	4.75	@ 5.00
New Light Oxfords	4.00	@ 4.25
New Light Prints	2.25	@ 2.50

Old Rags

No. 1 White Linens	5.75	@ 6.00
No. 2 White Linens	5.00	@ 5.25
No. 3 White Linens	3.50	@ 4.00
No. 4 White Linens	2.00	@ 2.50
No. 1 White Cotton	4.25	@ 4.75
No. 2 White Cotton	3.25	@ 3.50
No. 3 White Cotton	2.50	@ 3.00
No. 4 White Cotton	1.45	@ 1.60
Extra Light Prints	1.90	@ 2.10
Ord. Light Prints	1.60	@ 1.75
Med. Light Prints	1.40	@ 1.55
Dutch Blue Cottons	1.50	@ 1.60
French Blue Linens	2.25	@ 2.40
German Blue Linens	2.00	@ 2.10
German Blue Cottons	1.35	@ 1.40
Checks and Blues	1.25	@ 1.30
Lindsay Garments	.75	@ .80
Dark Cottons	.70	@ .75
Old Shopperies	.55	@ .60
New Shopperies	.60	@ .65
French Blues	1.40	@ 1.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	1.10	@ 1.20
Domestic	1.15	@ 1.25
Wool Tares, light	1.00	@ 1.05
Wool Tares, heavy	1.00	@ 1.10
Bright Bagging	1.00	@ 1.05
Small Mixed Rope	.90	@ 1.00
Manila Rope—		
Foreign	1.50	@ 1.60
Domestic	1.50	@ 1.75
New Burlap Cut	1.70	@ 1.80
Hessian Jute Threads—		
Foreign	2.60	@ 2.75
Domestic	2.80	@ 3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, white, No. 1	2.55	@ 2.75
Hard, white, No. 2	1.90	@ 2.00
White envelope cuttings	2.05	@ 2.15
Soft, white, No. 1	1.70	@ 1.80
Flat Stock—		
Stitchless	.70	@ .80
Overissue Mag.	.70	@ .80
Solid Flat Book	.60	@ .70
Crumped No. 1	.45	@ .50
Solid Book Ledger	1.75	@ 1.85
Ledger Stock	.60	@ .70
New B. B. Chips	.20	@ .30
Manilas—		
New Env. Cut	1.75	@ 1.85
New Cuttings	1.40	@ 1.50
Extra No. 1 old	1.05	@ 1.15
Print	.45	@ .50
Bogus Wrapper	.45	@ .50
Container	.25	@ .30
Old Kraft Machine—		
Compressed bales	1.00	@ 1.10
News—		
No. 1 White News	1.60	@ 1.65
Strictly Overissue	.35	@ .45
Strictly Folded	.25	@ .30
No. 1 Mixed Paper	.15	@ .20
Common Paper		Nominal

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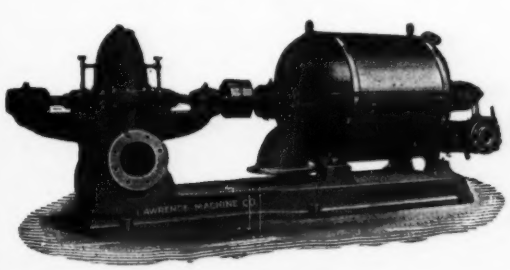

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Lawrence Machine & Pump Company
361 Market St. Lawrence, Mass.

Twines
(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.13	@	.14
No. 2	.11	@	.12
Tube Rope—			
4-ply and larger	.10¾	@	.11¾
Fine Tube Rope—			
4-ply	.11	@	—
3-ply	.12	@	—
2-ply	.13	@	—
Paper Makers Twine Balls	.07	@	—
Box Twine, 2-3 ply	.07	@	.08
Jute Rope	.09	@	.10
Amer. Hemp, 6	.27	@	.29
Java Sisal—			
No. 1 Basis	.10	@	—
No. 2 Basis	.09	@	—
New Zealand Sisal	.10	@	—
Sisal Lath Yarn—			
No. 1	.12	@	.14
No. 2	.10	@	.12
Manila Twine	.23	@	.28

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¾	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manilt	.04	@	.04½
No. 1 Kraft	4.50	@	5.00
Southern Kraft	3.00	@	3.25
No. 2 Kraft	3.00	@	3.25
Wood Tag Boards	.04¼	@	.05¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.07	@	.07¼
White Tissue	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	57.00	@	—
Sheets	62.00	@	—
Boards, per ton—			
Plain Chip	30.00	@	35.00
Solid News	32.50	@	37.50
Manila Lined Chip	40.00	@	45.00
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	1.95	@	2.05
No. 1 Soft White	1.80	@	1.90
Ledger & Writings	.60	@	.70
Solid Books	.60	@	.70
Blanks	1.40	@	1.55
Krafts	1.15	@	1.25
New Kraft Cuts	1.30	@	1.45
Manila Env. Cuts	1.40	@	1.50
Ex. No. 1 Manila	1.25	@	1.30
Print Manila	.40	@	.45
Overissue News	.40	@	.50
Old Newspapers—			
No. 1	.35	@	.45
No. 2	.30	@	.35
Mixed Papers—			
No. 1	.25	@	.30
No. 2	.25	@	.25
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.20
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04¼	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.09
Manila Sul., No. 1	.03	@	.05
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03¾	@	.04¼
Southern Kraft No. 1	—	@	.04
Southern Kraft No. 2	—	@	.03¾
Common Bogus	.03	@	.04
(Delivered Philadelphia)			
News Print Rolls	58.00	@	62.00
Straw Board	50.00	@	—
News Board	30.00	@	32.00
Chip Board	25.00	@	27.50
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	73.00	@	75.00
No. 2, per ton	63.00	@	65.00
Carload lots	62.00	@	67.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.06	@	.06½
New White, No. 2.	.05	@	.05½
Light Silesias	.05	@	.05½
Silesias, No. 1	.06	@	.08
Black Silesias, soft.	.05	@	—
New Unbleached	.06	@	.06½
Washable, No. 1	.02½	@	.03
Blue Overall	.05	@	.05½
Cottons—According to grades—			
Washable, No. 2	.02	@	.02½
New Blue	.02	@	.02½
Fancy	.03	@	.03¼
New Black Soft	.03	@	.03½
New Light Seconds	.01¾	@	.02
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O.D.	.04½	@	.05
No. 2 Mixed	.03½	@	.04
Corduroy	.02½	@	.03
New Canvas	.06½	@	.07
New Black Mixed.	.03	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	2.25	@	2.75
M. G.	4.50	@	—
Thirds and Blues—			
Miscellaneous	1.25	@	1.50
Repacked	1.75	@	2.00
Black Stockings (Export)	3.80	@	4.00
Roofing Stock—			
Foreign No. 1	1.15	@	1.25
Repacked	.80	@	.90

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	2.25	@	2.50
Sisal Rope	1.25	@	1.50
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.30	@	2.50
No. Hard White.	2.00	@	2.25
No. 1 Soft White.	1.75	@	2.00
No. 2 Soft White.	1.40	@	1.50
No. 1 Mixed.	.75	@	.80
No. 2 Mixed.	.50	@	.55
Solid Ledger Stock.	1.35	@	1.40
Writing Paper.	.80	@	1.00
No. 1 Books, heavy.	.70	@	.75
No. 2 Books, light.	Normal		
No. 1 New Manila.	1.60	@	1.75
No. 1 Old Manila.	1.25	@	1.30
Print Manila.	.50	@	.55
Container Manila.	.40	@	.45
Old Kraft.	1.10	@	1.20
Common Paper.	.30	@	.40
No. 1 Mixed Paper.	.35	@	.45
Straw Board, Chip.	.35	@	.45
Binders Board, Chip.	.35	@	.45
Corrugated Board.	.45	@	.50
Overissue News.	.50	@	.55
Old Newspaper.	.30	@	.35

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.05½	@	.11½
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04½	@	.05½
No. 2 Kraft	—	@	.03
(F. o. b. Boston)			
Southern Kraft	—	@	.03
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¾
(Delivered New England points)			
News Print, rolls	—	@	56.50
Straw Board, rolls	.009	—	@52.50
Straw Board in Sheets, basis 35s to 70s	—	@	50.00
Filled News Board	.27.50	@	30.00
Chip Board	—	@	25.00
Chip Board (Creasing)	.27.50	@	30.00
Single Manila Lined Chip	—	@	35.00
Single White, Patent Coated News Board—			
Binder	52.50	@	60.00
Wood Pulp Board	.70.00	@	75.00
Binder Boards	.67.50	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.50
No. 2 Hard White	2.25	@	2.50
No. 1 Soft White	1.75	@	2.00
No. 2 Mixed	.50	@	.55
No. 1 Mixed	.75	@	.85
Solid Ledger Books	1.75	@	2.00
Overissue Ledger Stock	1.35	@	1.60
Mixed Ledgers	1.15	@	1.30
No. 1 Books, heavy	.65	@	.75
No. 1 Books, light	—	@	.45
Crumpled Stitchless Book Stock	1.00	@	1.25
Manila Env. Cuttings	1.85	@	2.00
No. 1 Old Manila	—	@	1.00
White Blank News	1.40	@	1.50
Kraft No. 1	.85	@	.95
Manila	.90	@	1.00
No. 1 Mixed Paper	.17½	@	.20
Print Manila	.40	@	.45
Overissue News	.35	@	.40
Old Newspapers	.22½	@	.27½
Box Board, Chip	.17½	@	.20
Corrugated Boxes	.32½	@	.37½

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.15
Domestic	1.40	@	1.50
Manila Rope—			
Foreign	1.50	@	1.75
Domestic	1.75	@	2.00
Transmission Rope	1.25	@	1.40
Mixed String	.25	@	.35
Jute Rope	1.00	@	1.15
Jute Carpet Threads	.75	@	.90
Bleachery Burlap	2.50	@	2.75
No. 1 Scrap Burlap	1.00	@	1.10
Scrap Sisal	1.15	@	1.25
Scrap Sisal for shredding	1.30	@	1.40
Wool Tares, heavy	1.25	@	1.30
New Burlap Cutting	1.50	@	1.75
Australian Pouches	2.00	@	2.25
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging	.90	@	1.05
Bagging No. 2	.50	@	—
No. 1 Burlap	—	@	3.50

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1.	.05½	@	.06
New White No. 2.	.04½	@	.05
Silesias No. 1	.04½	@	.05
New Black Silesias	.02½	@	.02¾
New Unbleached	.04½	@	.05
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades—			
Blue Overalls	.05	@	.06
New Black, soft	.04	@	.04¼
Khaki Cuttings	.03	@	.03½
O. D. Khaki	.04½	@	.05
Corduroy	.03	@	.03½
New Canvas	.08	@	.08½

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	—	@	4.00
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.00	@	2.25
Thirds and Blues—			
Repacked	1.60	@	1.80
Miscellaneous	1.00	@	1.20
Black Stockings	3.25	@	3.50
Roofing Stock—			
No. 1	.48	@	.53
No. 2	.43	@	.48
No. 3	.38	@	.43

Foreign Rags

Dark Cottons	.55	@	.60
(F. o. b. Boston)			
New No. 1 White Shirt Cuttings	5.00	@	5.50
Dutch Blues	—	@	1.80
New Checks & Blues	4.00	@	4.50
Old Fustians	1.55	@	1.65
Old Linsey Garments	.65	@	.70

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¾	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.11¼	@	—
No. 2 Colored	.09	@	.10½
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (Carloads)	6.65	@	—
No. 3 M. F. (Carloads)	6.20	@	—
No. 1 S. C. (carloads)	7.15	@	—
No. 3 S. C. (carloads)	6.65	@	—
No. 4 S. C. (carloads)	5.70	@	—
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.50	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.60	@	—
White Wrap	5.10	@	—
"B" Manila	5.00	@	—
No. 1 Manila	5.60	@	—
Fiber	5.60	@	—
Kraft, M. F.	5.98	@	—
Kraft No. 2	5.60	@	—

(Delivered Toronto)

News, per ton—			
Rolls (contract)	56.50	@	57.00
Sheets	61.50	@	—

Pulp
(F. o. b. Mill)

Ground Wood	30.00	@	32.00
Sulphite easy bleaching	50.00	@	—
Sulphite, news grade	44.00	@	—
Sulphite, bleached	62.50	@	75.00
Sulphate	60.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.85	@	—
Soft White	2.40	@	—
White Blk. News	1.50	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	—
Light and Crumpled Book Stock	.80	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut	1.70	@	—
Printed Manilas	.65	@	—
Kraft	1.75	@	—
News and Scrap—			
Strictly Overissue	.50	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09½	@	.10
Fancy Shirt Cuttings	.06	@	.06¾

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PAPER TRADE JOURNAL
ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

SIXTIETH YEAR

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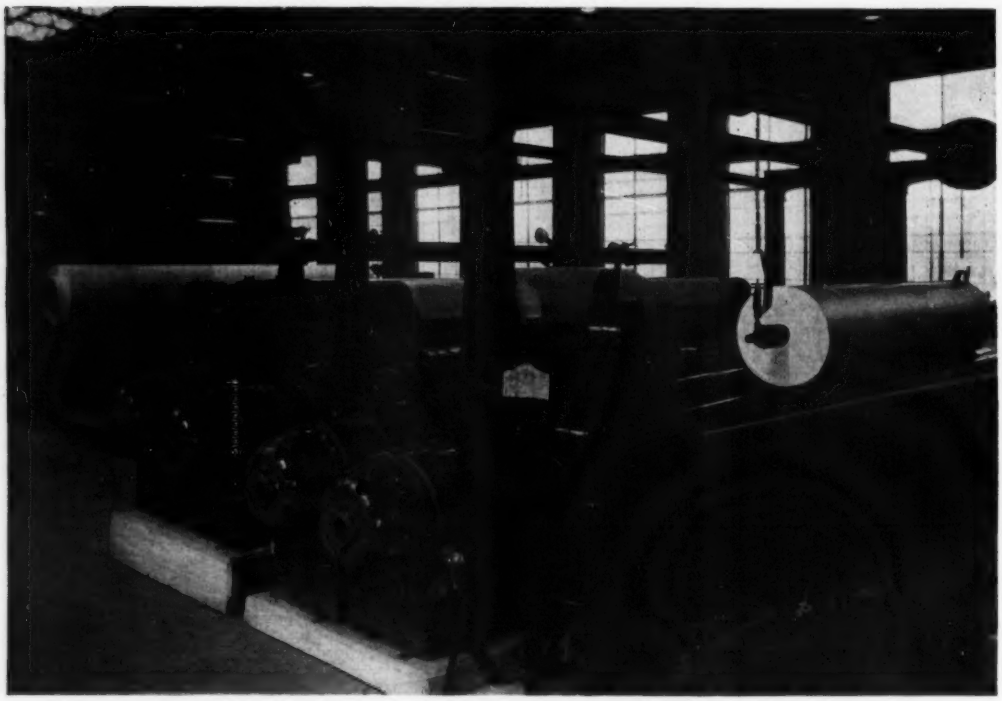

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(Motors furnished by Reliance Electric Co.)

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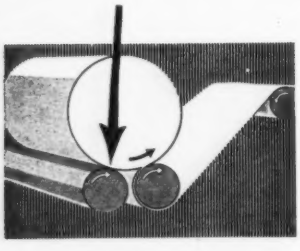

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